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The Railway Returns for 1935

THE Ministry of Transport railway returns for 1935, which have just been published, show a further increase in passenger bookings, the total of 856,196,433 (excluding seasons) comparing with 829,667,776 in 1934. There were 18,803,392 more in the third class, while the number of first class passengers, which has remained fairly uniformly in the eleven millions since 1932, went up to 13,415,640, receipts from this source being higher by 6·78 per cent. as compared with a third class gain of 3·0 per cent. This is in spite of a decline in the average receipt per first class journey from 5s. 2·64d. in 1934 to 4s. 10·88d., caused by the reduction in 1935 of first class monthly return and other cheap tickets to 50 per cent. above the corresponding third class fare. The proportion of passengers taking advantage of reduced fare facilities other than seasons or workmen's tickets has increased slightly—from 85·32 to 85·99 per cent. of the total—and 69·96 per cent. of all journeys (excluding seasons and workmen) are made with day or half-day excursion tickets. Receipts from passenger journeys as a whole were higher by £1,481,646, or 2·83 per cent. The largest gain in freight traffic was one of 829,382 tons in coal, coke, and patent fuel, making a total in this classification of 174,817,089 tons. Goods train receipts of all classes improved by £741,967.

Relieving the Liverpool Street Rush Hour

When opening a recent exhibition of L.N.E.R. rolling stock and locomotives at Romford, Col. H. H. Mauldin, Superintendent, Eastern Section, Southern Area, replied to criticisms of the accommodation provided on the Liverpool Street suburban services. He pointed out that narrow compartments with straight-backed seats are the only means of making the carrying capacity of the trains conform to the demand for room, having regard to the limitations imposed upon their length by the short platforms. The same factor precludes the possibility of acceleration by the use of large locomotives. There were, he said, actually more seats available than passengers carried, but overcrowding arose from the concentration of the rush period into a single hour, during which 35,000 passengers passed out of Liverpool Street station and 120 trains were dealt with. If the peak could be spread over two to two and a half hours, every passenger could be provided with a seat. With the forthcoming electrification, however, almost twice the number of trains would be run in the rush hour, while it was hoped that the institution of a regular-interval service during the rest of the day would increase the popularity of rail travel.

* * * *

The Week's Traffics

With so many travellers preferring a long week-end to a day trip, as demonstrated by the large passenger increases of all companies last week, it is not surprising that the period including the August bank holiday Monday itself shows less spectacular results. Those companies which have lost on the bank holiday swings, however, can find consolation in their earlier achievements on the roundabouts. The Southern Railway—the only line not showing an improvement in merchandise and coal for the week, is respectively £15,000 and £59,000 better in these classes on the aggregate. Total receipts of all companies are £2,717,000 above their level at this time last year.

	32nd Week								Year to date	
	Pass., &c.		Goods, &c.		Coal, &c.		Total		Inc. or Dec.	
	£		£		£		£		£	%
L.M.S.R. ..	+	7,000	+	24,000	+	11,000	+	42,000	+ 1,434,000	+ 3·88
L.N.E.R. ..	–	6,000	+	6,000	+	5,000	+	5,000	+ 820,000	+ 3·05
G.W.R. ..	–	2,000	+	9,000	+	1,000	+	8,000	+ 332,000	+ 2·15
S.R. ..	+	2,000	–	2,000	–	1,000	–	1,000	+ 131,000	+ 1·05

London Transport receipts improved by £9,800 for the week including bank holiday.

* * * *

Lime Street Station, Liverpool

Tomorrow (Saturday) one of the best-known stations in Great Britain celebrates its 100th birthday, for it was on August 15, 1836, that the Liverpool & Manchester Railway opened to public traffic its new terminus in the heart of Liverpool. When the line was opened on September 15, 1830, its passenger terminus in that town was at Crown Street, a point selected to keep the railway as little in evidence as possible and so avoid opposition. Rapidly growing traffic demanded more adequate terminal facilities and a 2,230-yd. tunnel from Edge Hill (since 1881 almost entirely opened out) was undertaken in order to build a centrally-situated station in Lime Street. The *Liverpool Times* of the period described the tunnel as "one of the greatest works ever executed in this neighbourhood," and the roof of "the remarkably handsome shed" (the station) as "one of the largest roofs of the kind in Europe, being considerably larger than that of Westminster Hall." The Common Council of Liverpool contributed £2,000 out of the town's funds towards the architectural decorations. From Edge Hill trains descended the 1 in 93 gradient to Lime Street by gravity under the control of a brake van, and in the reverse direction were hauled out of Lime

Street by cable. The *Liverpool Mercury* of September 9, 1836, spoke of the means of signalling communication through the tunnel by which "a powerful current of air is driven through the tube with sufficient force to ring a bell or blow an organ pipe, which latter has been preferred." Locomotives did not work through to Lime Street until March, 1870.

* * * *

Reindeer or Railway Tickets

In a vocabulary of everyday requirements appended to a guide for travellers in Finland, we noticed that reindeer were included but railway tickets were not. By one of those incalculable freaks of circumstance that contrive to outwit the most provident compiler of phrase books, it so happened that our own usually modest requirements extended to a train journey but did not include the quadruped. The author would no doubt have justified his choice by pointing out that the reindeer is not only a means of transport but, in the opinion of the natives, a foodstuff, and therefore a particularly useful companion for a stranger in a strange land. The same cannot, we confess, be urged in favour of the railway ticket, the consumption of which, though perhaps less deleterious to the digeston, complicates unnecessarily the work of collectors and accountants. Nor does the ticket make up for its gastronomic limitations by its literary merit, the letterpress of the cheaper varieties in particular being too admonitory for pleasurable reading. Nevertheless, the reindeer is very far from our idea of a common carrier, and we propose still to adhere to the less conspicuous and versatile, but more portable pasteboard.

* * * *

Overseas Railway Traffics

Only two of the Argentine railway receipts maintain the improvement upon the 1935 figures recorded a fortnight ago. The Buenos Ayres Great Southern, however, is nearer by £9,947 to its result of last year. The Buenos Ayres Western has suffered a considerable setback, as its takings for the fourth week had shown a gain of £3,277. Both the companies whose figures are still on the right side, however, have improved their advantage—the Central Argentine by £10,733.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	6th	75,585	+ 1,554	415,500	— 21,557
Buenos Ayres Great Southern ..	6th	112,939	— 4,159	599,275	— 77,170
Buenos Ayres Western	6th	218,278	— 4,249	218,278	— 20,581
Central Argentine	6th	135,416	+ 16,341	716,666	— 14,656
Canadian Pacific	31st	472,800	— 8,200	15,197,200	+1,184,200
Bombay, Baroda & Central India	18th	198,825	+ 24,525	2,924,475	+ 198,675

Aggregate increases of the Canadian Pacific, and Bombay, Baroda & Central India Railways are respectively £1,800 and £21,375 in advance of those a fortnight ago.

* * * *

American Railway Economies

It has been stated by Mr. M. J. Gormley, Executive Assistant, Association of American Railways, that if the companys in the U.S.A. had been subject to the same unit cost of operation in 1935 as in 1920, the handling of last year's business would have cost them over a billion (one thousand million) dollars more than it actually did. The economies were largely the result of scientific progress which had enabled the speed of goods trains to be increased by 55·3 per cent. between 1920 and 1935, and the gross ton-miles per freight train-hour by 93·4 per cent. Furthermore, such measures as joint working of services, stations, and so on, amounted, according to a survey made a few years ago, to 5,634 co-operative operations. Since May 1 last year, a new plan has been in force for the settlement of car hire for box cars between the companies which should save approximately ten million dollars annually. These savings have actually been accompanied by improvements in service. Mr. Gormley considered such achievements to be sufficient indication of the ability of the railways to set their own house in order, and, given freedom from bureaucratic interference, he thought they would be able to reduce their charges until they were safe from all competition for the traffic that was rightly theirs.

* * * *

A John o' Groats Excursion

For most Britons the name John o' Groats has an extraordinary fascination which, in fact, it does not merit, for the point where Groot the Dutchman settled in the 16th century is not, as is commonly supposed, the most northerly point in Scotland, nor is it in any way more spectacular than any other spot along the Caithness coast line. Still, the delusion is well established in the public mind, and perhaps it is with a view to enlightening its readers that the *Glasgow Weekly Herald*, in conjunction with the L.M.S.R., has arranged a special day excursion which will leave Glasgow (Buchanan Street) at 11.5 tonight for John o' Groats and elsewhere in the far north. The excursionists will reach Wick and Thurso at about 9.30 tomorrow morning, and leave again at 10 o'clock in the evening, arriving back in Glasgow at 8.15 on Sunday morning. The fare for the return journey of 684 miles is only 20s. 6d., and dining and sleeping cars will be attached to the train. The final stage of the pilgrimage to the point that is not the most northerly will be by bus from either Wick or Thurso. A novel feature of the leaflet announcing the trip is the inclusion of a double-spread diagram of the route, showing the principal landmarks and mileages.

* * * *

The Rugby Collision

The facts were not in dispute regarding the collision between two freight trains on the L.M.S.R. at Rugby on April 2, Colonel Trench's report on which will be found summarised on page 279. It was a simple case of misreading signals on the part of an experienced driver, who at once admitted his mistake, and unfortunately steam and smoke and the presence of some vans prevented his guard from realising what had happened, although he was looking out carefully. Such mistakes occur from time to time, fortunately not always followed by harmful results. It is practically impossible to explain them and they have to be accepted as one of the weaknesses of the human element that can never be quite eliminated. Colonel Trench does not consider that the arrangement of the signals needs altering, and has no recommendation to make in this case. Colour-light signals are likely to be installed in this area and this may assist in reducing the risk of misinterpretation, but we have already heard of a collision being narrowly avoided, due to a similar mistake with such signals. The detonator placers, worked from the box, were not available for use in the circumstances obtaining at Rugby. We have sometimes wondered why so little use has been made in this country of detonators working with the signals themselves at important places, a practice often applied to absolute stop signals in France.

* * * *

London to Aberdeen

Publicity concerning the substantial acceleration of the service from King's Cross to Aberdeen by the London & North Eastern Railway this summer has suggested that the 10 hr. 28 min. timing of the down Flying Scotsman between the two cities is the fastest on record. By the narrow margin of three minutes, however, the claim can-

not be sustained, for in the winter of 1895-1896, immediately succeeding the historic "Race to Aberdeen," the 8 p.m. sleeper from King's Cross was booked to reach Edinburgh in 7½ hr., and Aberdeen in 10 hr. 25 min. The London-Edinburgh time included stops at Grantham, York, and Newcastle, as compared with the non-stop run of today, which is made in 15 min. less time; but the then North British Railway made itself responsible for covering the 130½ miles of extremely difficult line from Edinburgh to Aberdeen in 2 hr. 51 min., with stops at Dundee and Arbroath only, as compared with five stops—Leuchars, Dundee, Montrose, Arbroath, and Stonehaven—included in the present schedule of 3 hr. 3 min. It was the Preston accident of 1896 that brought to an end the fast running, and caused the general slowing down of all the Anglo-Scottish services by both East and West Coast routes, but the 10 hr. 25 min. timing from King's Cross to Aberdeen persisted for long enough to be regarded as a regular service of which the overall time has not been beaten during the ensuing forty years. In the record runs of the "Race," of course, the overall times came down finally to 8 hr. 38 min. by the East Coast and 8 hr. 32 min. by the West.

* * * *

A Phenomenal Locomotive Feat

From time to time we have commented on the gradual improvement in the technique of locomotive driving which makes possible performances by locomotives of earlier types probably not thought possible by their designers at the time of their introduction; but seldom, if ever, previously have we been able to give publicity to an achievement equal to that described on page 278. The locomotive concerned was one of the large-boilered Ivatt Atlantics of the L.N.E.R. When these 69-ton engines were introduced on the Great Northern Railway in 1902, from 300 to 350 tons constituted a train of considerable weight; whereas the train figuring in this run consisted of 17 modern coaches weighing, with a full load of passengers and luggage, quite 585 tons. Needless to say, it was in an emergency that the Atlantic, unchanged in design from the day of its construction other than by the addition of superheating and the enlargement of its cylinders from 18¾ in. to 20 in. diameter, found itself at the head of this load. Up to the time of the war the train concerned was allowed 97 min. for the 82¾ miles from Grantham to York; today it is allowed 90 min.; and yet, with nearly twice the pre-war load, this veteran, in the hands of a North Eastern Area crew, actually cut the time to 87 min. 40 sec., and after the slow start inevitable with only 36 tons of adhesion, gained no less than 6 min. on schedule between Newark and Selby.

* * * *

Simple-Expansion Mallets

Within the limits of America and countries influenced by American locomotive practice, the words "Mallet" and "compound" are almost synonomous, partly because of the widespread adoption of compound expansion from the time of the Baltimore & Ohio 0-6-6-0 in 1904—the first articulated locomotive in the States—and partly because Anatole Mallet himself was a pioneer both in the application of compounding and the introduction of articulated units. Nevertheless, there are numerous Mallet articulated locomotives in the U.S.A., Brazil and elsewhere which have single-stage steam expansion, and almost without exception these locomotives are outstanding because of their size—even in a country where everything is on the large scale, or because of some feature such as relatively high operating speeds. The two largest locomotive types in the world, the Northern Pacific 2-8-8-4 Yellowstone class and the Southern Pacific 4-8-8-2 back-to-front oil burning series, are both of the four-cylinder simple type. Indeed, the increasing use to which the Mallet simple locomotive has been put during the last dozen years is due largely to the extra power which it can develop compared with the compound machines, for the enormous low-pressure cylinders of the biggest compound Mallets just pass within the extreme limits of the loading gauge. A typical example is the 48-in. l.p. cylinders of the Virginian Railroad 2-10-10-2 coal engines. Under certain conditions Mallet simple engines have shown a greater thermal efficiency than the compound type, but this is not general and is not taken as a reason for the change.

* * * *

Welding Economy

The question that naturally arises when investigating the advantages claimed for fabricated structures as compared with casting and riveting, is that of the relative costs, and another point of equal importance is relative durability. Some enlightenment on these matters was given in the course of a paper read by Mr. James H. Thom, on "Fabrication of Mobile Railway Structures," which is reprinted in the latest journal of the Institution of Locomotive Engineers. Taking the highest price as 100 per cent., the cost of producing a fabricated and welded shaft is likely to be only 35 per cent. as compared with the 100 per cent. for the same shaft made in one piece, or 75 per cent. where the shaft has the levers forged and keyed on. The same can be said of welding in other details of railway rolling stock, such as bell cranks, brake hangers, brake pull rods, and even reversing shafts. It will be found that the units evolved with welded fabrication solve many of the problems of a railway engineer, at the same time giving additional strength, and the ability to withstand stresses which, with the older methods of construction, would have been quite impracticable. Welded joints can be used with as much confidence as has heretofore been given to castings and riveted joints, but to make the greatest use of welding technique it is necessary to redesign the units as fabricated structures.

* * * *

Automaticity in Hump Yard Working

In a lecture before the Comité National de l'Organisation Française, M. Rabourdin, of the Chemins de fer de l'Est, gave an attractive picture of the possibilities for automatic devices in hump yards, the working of which has, since the war, been the subject of an extraordinary amount of investigation and not a little original thought, particularly in Germany, France, and America. The problem of braking descending wagons has been met by rail brakes and shoe brakes, controlled in a variety of ways, while automatic point working combined with route storage control has enabled movements to be made with the minimum of error. But much remains to be done. The influence of the weather persists, and may have considerable effect at times, and there are many classes of vehicle, themselves varying in running capacity and condition, leaving possibilities for misjudgment in handling and consequent damage to stock and contents, and possible injury to employees also. M. Rabourdin postulates an ideal of complete automaticity under which no collision should be possible, by the continuous and automatic provision of compensation for all varying factors, even those due to weather. The scheme outlined is not simple, but its advantages should be considerable if it can be realised. Presumably, we may expect to see something of this on the C. de fer de l'Est before long. Monsieur Rabourdin's lecture has been reprinted by the Comité.

XUM

Seaside and Country Travel Unlimited

THE multitudes of passengers who besieged the London termini and large provincial stations during the August holiday week-end afforded striking evidence of the popularity of the monthly return ticket with the travelling public. The combined appeal of the reasonable fare, freedom from restriction as to train service, extended availability, and break of journey facilities has resulted in a large increase in rail travel for holidays. But the railways are not content merely to convey holidaymakers to their destination. Five years ago it was realised that in the neighbourhood of many seaside and country resorts there are miles of railway from which views of infinite charm and variety can be obtained: also that most people desire to vary their holiday by making short trips to places of interest near where they are staying. Accordingly the companies introduced experimentally the seven days' holiday season ticket, designed to facilitate local travel at a very low cost. These tickets rapidly grew in popularity, especially with a Scotsman who travelled over 1,700 miles in one week with one of them! Today, there are 118 selected areas within which the public may obtain, between May 1 and October 31, holiday season tickets allowing unlimited travel within the specified district. Covering distances ranging from 200 to 250 miles, these tickets generally cost ten shillings for third class and fifteen shillings for first class travel, while similar tickets are issued for bicycles accompanying the holder at five shillings each, and for dogs at half-a-crown.

Included in the scheme are thirty-six zones in Scotland and the Border country, and nine areas which embrace rail and steamboat travel. Other tickets cover such interesting areas as East Anglia, the Yorkshire coast, moors and dales, parts of Devon and Cornwall, North Wales, West Wales, the Cambrian coast, the Lake and Peak Districts, and the Lancashire coast. For 7s. 6d. third class and 10s. 6d. first class the whole of the stations in the Isle of Wight, thirty-two in number, can be covered. All Clyde coast piers and steamers from Glasgow via Greenock, Gourock, Wemyss Bay or Craigendoran are open to the traveller for a week for one pound, while for 25s. the whole of the Clyde steamers sailing from Glasgow may be used for the same period. Giving somewhere new to go on every day of the week, and something fresh to do, these tickets are issued on demand at the principal railways stations and are undoubtedly meeting a growing need.

* * * *

Netherlands Railways in 1935

THE results of working of the Netherlands Railways in 1935 show that, contrary to hopes often expressed, it has not been possible to arrest the fall in receipts; this is attributed to road and waterway competition—especially the former—and the uncertain state of trade, consequent on disturbed political conditions, chiefly abroad. The position is most discouraging and shows no prospect of improvement, leaving the Government faced with a difficult problem. Revenue has fallen under all heads save one, the total working receipts being in round figures fl.101,000,000 against fl.112,000,000 in 1934, a decline of just over 10 per cent. As in that year, it is goods traffic which has been most seriously affected by unsettled conditions, trade and exchange restrictions, receipts from it declining 15·7 per cent., and those from passenger traffic by 5·9 per cent. Fortunately the revenue from postal and express parcels services increased a little, making a slight improvement in an otherwise depressing picture.

Passenger traffic declined under all headings save foreign, where a slight improvement of 1·82 per cent. was registered. Goods traffic showed similar results, transit traffic alone increasing to a small extent. The heaviest loss was in general inland goods, the receipts falling by fl.5,673,100, or nearly 16 per cent., while traffic to Germany brought in fl.1,305,882, 16·8 per cent. less. Inland livestock receipts were fl.258,965, 35·8 per cent., less, while the traffic to Belgium and Germany fell by about a third, a serious state of affairs. Changes in fares have possibly helped to hold some of the traffic. The so-called local passenger fares which applied only on certain sections were replaced by day return tickets as from July 1—obtainable for any journey all over the system—with such successful results that 25,493,812 of these tickets were issued. The summer return tickets at single fare, available from July to September, were not so much used, but other excursion facilities appear to have given fairly good results. As in 1934, the numbers of all classes of passengers decreased, by 101,550, 509,798, and 3,106,790 in first, second, and third classes respectively. Receipts from ordinary tickets to foreign countries showed practically no change, but there was a large transfer to the third class from the other two. Ordinary goods rates were not altered, but from November 1, 1935, by agreement with the postal authorities, there was an alteration in express parcels rates, up to 30 kg. in weight. The tonnes freight transported fell from 17,396,298 to 14,103,154, a much greater drop than in 1934, inland traffic being chiefly affected. To assist clients and retain their custom, shunting and demurrage charges were reduced, or in some cases abolished. Receipts from restaurants and advertising, and from special trains were less; there were practically no circus and theatrical party specials. Operating receipts are as follow:—

	1935	Difference Compared with 1934	Difference per cent.
	fl.	fl.	
Passengers and Luggage ..	54,549,003	— 3,427,854	— 5·91
Post and Express Parcels	2,929,532	+ 156,674	+ 5·65
Goods	41,280,390	— 7,734,238	— 15·77
Other Sources	2,361,388	— 255,864	— 9·78
Total Receipts ..	fl. 101,120,314	— 11,261,282	— 10·02

The drop in receipts was counterbalanced, though not completely, by lower working expenses, which amounted to fl.95,361,070, as against fl.104,143,261 in 1934, but the operating coefficient rose from 92·67 to 94·30. In all some 53,866,052 train-kilometres were run, 1,600,089 fewer than before. Costs per train-kilometre fell by fl.0·25 to fl.1·77. Wages and salaries amounted to fl.63,355,000, or fl.6,127,000 less, due to lower scales of pay and fewer employees, the total staff numbering 33,780 at the end of the year, a fall of 1,773. In six years the staff has been reduced by 17 per cent. Contributions to sickness and accident insurance, pensions, &c., were naturally less, the total reduction in staff expenses being fl.7,066,000, nearly double that made in 1934. Expenses under all other headings showed reductions, especially fuel, which cost fl.622,000 less, except that required to generate electric power. This rose by fl.34,000 to a total of fl.2,028,000 as the electric Rotterdam-Dordrecht service was in operation throughout the whole year against 7½ months only in 1934, the Schiedam-Hook and Haarlem-Zandvoort sections having been opened on May 15 and October 1 respectively in the latter year. The net operating credit balance was fl.5,759,244, or fl.2,479,000 less than in 1934, to which must be added fl.1,387,099 for hire of rolling stock, making a total of fl.7,146,343. This sum is fl.27,832,251 less than needed to meet the remaining charges on the undertaking, including interest, depreciation, use of joint stations, and cover for certain losses, which together total fl.34,978,594 against fl.40,482,204 in

1934. To this must be added payments by the State to the 4 per cent. bond holders, making a total of fl.29,652,342 to be paid over to the companies, fl.13,178,819 to the company for working the State Railways (S.S.), and fl.16,473,523 to the Holland Railway Company (H.S.M.).

* * * *

Belgian National Railways Company

THE Société Nationale des Chemins de fer Belges has since July, 1926, taken over the working of the State railways under a 75-year lease. In consideration of this lease a capital of fr. 11,000,000 was issued to the State, and an issue of guaranteed participating preference shares was made to the public, entitling the holders to a fixed dividend of 6 per cent., and to half the net profits remaining after making certain statutory deductions. Excess dividends were paid up to and including 1930, but have not been paid since. By a Royal decree of May 11, 1935, the fixed rate of interest has been reduced to 4 per cent., and each holder receives a capital bonus of 7½ per cent. The recently issued report for the year 1935 shows that the length of line in operation at the end of the year was 4,851 km., the same as at the end of 1934. Gross receipts in 1935 showed a decrease of fr. 1·6 million, or 0·1 per cent., in comparison with 1934. There was a considerable improvement in passenger numbers and receipts, largely attributable to the Brussels Exhibition. The tonnage of goods showed an advance of 4·4 per cent., but receipts therefrom were 5·4 per cent. lower, partly because of a general tariff reduction of 10 per cent. required by the Government, and partly on account of reductions in rates made by the company to meet the ever-increasing competition of other forms of transport. Passenger train-kilometres increased from 54·8 millions to 55·7 millions, and goods train-kilometres were 19·6 millions in both years.

The replacement of light trains by railcars continued. During the summer of 1935 trains ran regularly between Brussels and Ostend in 74 minutes, at a speed of 100 km. an hour. Goods services have been improved and accelerated, and there was a notable advance from 228·8 tonnes to 243·2 tonnes in the average net train load. Door-to-door transits and the number of containers in use have been greatly extended. Concessions for working eight new bus routes were granted to the company during 1935, worked by lessees who pay the company a percentage of the net receipts. At the end of the year the company had concessions for 34 routes of a total length of 756 km. Twenty-eight of these were worked under leases similar to those mentioned above. On the remaining six routes the company takes the receipts but entrusts the operation of the services to contractors for fixed sums. Simplified methods of working have already been applied to 1,180 km. of secondary lines, and are to be applied to an additional 219 km. The resulting economies are estimated at fr. 20,000,000 a year. Close co-operation with the *vicinaux* lines is also being pursued with advantage. The accompanying table compares some operating figures:—

	1935	1934
Passengers (in millions) ..	181·7	176·8
Tons (in millions)	58·7	56·2
Ton-kilometres (in millions) ..	4,757·2	4,483·0
Train-kilometres (in millions) ..	75·3	74·4
Operating ratio, per cent. ..	96·45	102·16
	Fr.	Fr.
Passenger receipts	705,727,848	663,836,592
Goods receipts	1,344,323,276	1,432,784,387
Total receipts	2,213,579,111	2,215,171,191
Total expenses	2,134,868,512	2,263,153,321
Net receipts	78,710,599	Dr. 47,982,130

In working expenses there was a reduction of fr. 128,284,809, or 5·67 per cent. Expenses of the staff accounted for 63 per cent. of the total. Materials took 15·54 per cent., and renewal funds 16·97 per cent. Electrification between Brussels and Antwerp was completed on April 23, 1935, and electrical working was inaugurated on May 5. During the year 55 level crossings have been abolished, including those on the Brussels-Antwerp line. Fifteen high-speed Pacific locomotives were delivered during the year. Of railcars in use in 1935 there were 25 diesel-mechanical, 3 diesel-electric, and 4 steam. Eleven railcars were under construction at the end of the year; 500 steel coaches for suburban service are on order.

* * * *

Permanent Way for High Speeds

THE monthly Bulletin of the International Railway Congress Association of April, 1936, contains an interesting contribution by Prof. Felice Corini of the Royal Higher Engineering School of Genoa, in regard to this matter. Referring to the necessity of very high railway speeds being attained to meet competitive traffic the author points out that "rational layouts and gradients which will meet modern requirements can be adopted. The joints however, remain and form one of the obstacles to high speed."

In the first of the three notes which constitute the article, the expansion of rails is treated mathematically in a straightforward and non-controversial manner. It is shown that the resistance to expansion or contraction arises from friction between the rails and fishplates, plus the friction between the rails and their supports, or between the sleepers and top ballast upon the bottom ballast, whichever is the lesser. From this it is clear that if expansion is plotted against temperature changes between given limits the movement of the rail ends in terms of temperature follows a cycle similar to the magnetic and elastic hypteresis curve. The importance of this deduction lies in the fact that there is thus no well-defined correspondence between temperature at a given instance and the amount of expansion of the rails. In brief, the first note contains mathematical calculations to determine the longest possible rail length which may be used, by ascertaining the expansion of the rail and corresponding longitudinal sliding, deformation of the track in the laying plane, the length of rail in relation to the greatest permissible gap, and deformations in a vertical plane. As a result of these investigations, one of the first practical conclusions is the value of electrically preheating rails before welding into continuous lengths, so that under temperature variations the rail would be subjected to tensile rather than compressive stresses.

The second note quantifies the calculations of the first, using as a basis the physical properties of the Italian State Railways "F.S. 46^3" track with sleepers spaced at 2 ft. 1⅝ in. centres, and data obtained experimentally with this material. It is found that expansion or contraction produces sliding of the whole track but no sliding takes place between the rails and supports. Further, it was determined that the rails can be welded together in lengths of 354 ft., provided they are heated to 90° F. at the time of welding, they will then be stable for temperature variations between − 13° F. and 131° F., the most severe condition being at − 13° F. when the rails will be subjected to a tensile stress of 6·35 tons per sq. in. The maximum gap would be 0·50 cm. Finally it is shown that if the sleepers were anchored by tying them together longitudinally with flat steel bars fixed to their ends and connecting them to concrete posts embedded in the ground, an unlimited number of rails could be welded together and the joints eliminated. The third note gives a detailed account of the experiments carried out in order to obtain the required practical data as regards resistance to sliding between the various components of the track.

XUM

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Fastest Trains in Great Britain

163, Marlborough Road,
Gillingham, Kent
August 3

To the Editor of The Railway Gazette

Sir,—In your editorial comment on the fascinating table appearing in The Railway Gazette for July 31, you make the interesting point that the Great Northern Section of the L.N.E.R. is the site of 75 per cent. of the 1,633 miles booked over the L.N.E.R. at 60 m.p.h.

More striking still is the proportion claimed by the former L.N.W.R—now Western Division—in the case of the L.M.S.R. of the 2,633 L.M.S. miles at 60 m.p.h. No fewer than 2,388 miles appear to be over the former L.N.W.R. or over 90 per cent.

The remaining 245 miles are provided by the Midland Division. The other constituent companies of the L.M.S. are conspicuous by their absence from the table, unless we should allocate to the former North Staffordshire Railway, the Stoke-Colwich part of the 1.15 p.m. from Stoke to Euston.

It is interesting, in view of your remarks on the march of speed, to note that it was as recently as April, 1932, that the first 60-m.p.h. booking appeared on the L.M.S.R. —the 5.12 p.m. from Coventry to Willesden. Today that railway has 29 such runs.

Yours faithfully,
A. P. LE M. SINKINSON

Running Shed Work Systems

Charles Street, Alfreton,
Derbyshire,
August 3

To the Editor of the Railway Gazette

Sir,—I was very much interested in your editorial note on page 175 of the issue dated July 31, regarding the system adopted by the Buenos Ayres & Pacific Railway in carrying out scheduled maintenance of locomotives. I think, however, that it will be generally accepted that a system of examinations carried out on a combined periodical and mileage basis is most suited to the economical maintenance of locomotives. With this system, boiler mountings, including injectors and possibly components of the vacuum or air brake, are examined on a period basis, the period varying according to class of engine, type of fitting, or district to which engine is allocated. On the other hand, valves, pistons and motion details, of which the wear is roughly proportional to mileage run are examined on a mileage basis. Further, if a proper system of analysing drivers' daily duty statements, or trip journals is in operation, it is difficult to understand why there should be any delay in assessing the mileage run by individual engines, more especially when motive power is pooled, for then the mileage to be run by any particular locomotive can actually be *pre-determined* by reference to the diagrammed workings which it is scheduled to work.

Yours truly,
W. G. F. THORLEY

The "Buffer Car"

60a, Green Lane,
Northwood, Middlesex.
August 1

To the Editor of The Railway Gazette

Sir,—In the amusing note in your issue of July 24 on *Bradshaw's* misprint, whereby the Great Western Railway is credited with running a *buffer* car, you ask if such a contrivance has ever been suggested for taking the shock of a collision. In the correspondence columns of *The Railway Times* of October 16, 1841, Mr. William B. Adams, commenting on the recent Haywards Heath accident, wrote: "There is yet another point—the importance of a buffer carriage between the tender and the train collapsing through a sufficient space to expend much of the momentum of the train when by accident the engine does get off the line." Mr. Adams promised a specification. Another correspondent in the following week wrote in praise of the suggested "buffer vehicle."

Your obedient servant,
REGINALD B. FELLOWS

PUBLICATIONS RECEIVED

Windsor.—It is an attractive picture that Miss Mary Munton conjures up in a splendidly-produced illustrated booklet, bearing this title, just issued free by the Great Western Railway. In her imagination Miss Munton appoints herself a guide to conduct no less distinguished an audience than the long line of English kings and queens around their own ancestral home. The castle, which today rises benign above the Thames, its grim battlements weathered into sheer beauty, provides splendid material for Miss Munton's vivid pen. She revels in describing Garter blue and brocaded state apartments, and inspires a thrill when looking down into the now empty dungeons which once witnessed the barbarity that accompanied the flamboyant mediæval pageantry. We are made to realise with what different thoughts from those of our own little Princess Elizabeth must poor Lady Jane Grey have trod the castle battlements. We are also reminded with what ease and comfort may those today in search of England travel by railway to see Windsor for themselves.

South Africa.—South African Railways, Airways & Harbours Publicity Department. 10 in. × 12½ in. Illustrated.—This entirely pictorial volume consists of 34 pages of excellent photographic reproductions of landscapes, cities, native types, and other tourist attractions in South Africa. It is well got up and, in view of the forthcoming Empire Exhibition at Johannesburg, should assist materially in inducing visitors to spend additional time in the Union and see the various places depicted.

Roller Bearing Axleboxes for Railway Use.—The selection of modern locomotives and rolling stock illustrated in a new catalogue which we have received from the Hoffmann Manufacturing Co. Ltd., Chelmsford, demonstrates the welcome accorded to the firm's axleboxes wherever conditions call for such equipment planned on progressive lines. Engines and vehicles for many varieties of railway service are represented, ranging from the Stanier Pacifics of the L.M.S.R. to electric motor coaches for the Metropolitan Line of London Transport. Both passenger and goods rolling stock for steam railways has also been fitted with Hoffmann axleboxes; the examples shown in the catalogue include a buffet car for the North Atlantic Express of the L.M.S.R. (N.C.C.), and a 20-ton goods brake of the L.M.S.R. The bearings of the latter have been in use for over three years without dismantling. Railcar designers have also availed themselves of the low running friction, improved coasting, and other qualities of Hoffmann axleboxes. A Sentinel-Cammell car of the San Paulo (Brazilian) Railway makes use of them not only for the running wheels, but for the crankpins, mainshafts, and eccentrics of the engines, and for the suspension.

THE SCRAP HEAP

NOVELISTS AND RAILWAYS

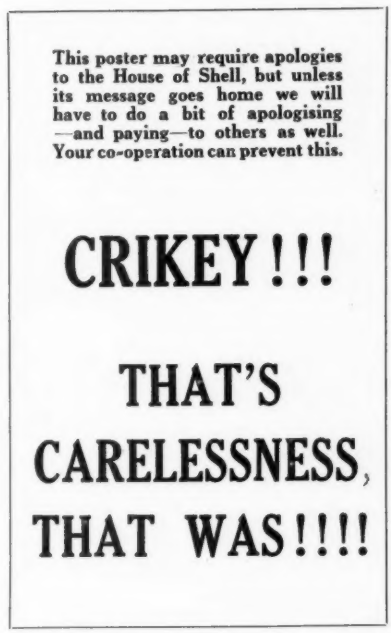
Still more evidence about the weakness of novelists on railway travel: In putting into his latest book a railway route and a platform which are unknown to "Bradshaw" Mr. Aldous Huxley follows the example of many noted novelists. In "The Dynamiter" Robert Louis Stevenson sent Challenor from London to Glasgow by a train which started from Euston and arrived at St. Enoch's station. Strange things of that sort happen nowadays as the result of the amalgamation of routes which were formerly rivals, but in Stevenson's day that simply was not done. In some ways it is specially surprising to find Conan Doyle sending Sherlock Holmes and his chronicler from Bath to London via Clapham Junction—my dear Watson! In a recent novel Mrs. Virginia Woolf makes someone wait for a friend at the barrier on a main-line arrival platform at Euston, whereas, as Manchester travellers know, those arrival platforms are "open." Some years ago Mr. P. G. Wodehouse dispatched one of his interesting people by a liner special from Paddington to Liverpool, and not only so but placed a tunnel immediately outside that station.—*From "The Manchester Guardian."*

* * *

The continued popularity in Germany of model railways will be clearly shown by the wide range of accessories to be shown at the Leipzig Autumn Fair to be held from August 30 to September 3. The novelties of the electric railways will outnumber all others. Electromagnetic points and signals, and barriers which close automatically at the approach of a train and re-open afterwards will be prominent features. The execution of all parts, including the smallest details, will be a faithful reproduction of the original—not even the advertising posters will be missing from the railway stations.

* * *

The L.N.E.R. has decided to instal an up-to-date dance floor in the Abercorn Rooms, Great Eastern Hotel, Liverpool Street. The Abercorn Rooms are greatly in demand for functions of various types and it is felt that the dance floor, which is to be installed in the Cambridge Room, will increase this popularity.


This poster may require apologies to the House of Shell, but unless its message goes home we will have to do a bit of apologising —and paying—to others as well. Your co-operation can prevent this.
CRIKEY!!!
THAT'S CARELESSNESS, THAT WAS!!!!

No. 4 of a series of "claims prevention" posters recently issued by the Chief Goods Manager, Great Western Railway, for exhibition to the staff

One Hundred Years Ago

Extracts from the August, 1836, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE

Padstow & Falmouth Railway.—A public meeting has been held at the Guildhall, Callington, to consider the best means of carrying this projected undertaking, and also the breakwater at Padstow, into effect; and several spirited resolutions were passed, expressive of the determination of the company to use every means in their power to accomplish their design.

Newcastle & Carlisle Railway.—That portion of this railway just opened from Carlisle to Greenhead, about 20 miles, passes through a highly picturesque country, and the works are in several cases on a most magnificent scale. The viaducts at Wetheral, Corby, and the river Gelt, may rank among the most important engineering works yet executed; and the cutting at the Cowran Hills, by the vastness of the excavations, and the beauty of the adjacent scenery, cannot fail to create a pleasing surprise in every spectator.

Southampton Railway.—The inhabitants of the Channel Islands will be highly gratified to learn that the Southampton railroad is being completed with all possible despatch. There are no less than 300 persons employed in the small space between Southampton and Winchester. It is expected that the whole line of road will be completed in the early part of the year 1838. If Messieurs the Navigators will permit, the part to Kingston will be opened, it is expected, in about one year. A great number of men are employed in the work between Northam and Portswood; an excellent foundation has been found beneath the mud land-section, and a great extent of brickwork is in course of erection.

Miles of Railroad in the United States.—It is computed that they already amount to 3,000. If a double track is made to each, they will require 714,000 tons of iron for rails; which if paid to Great Britain during the next seven years will amount to *fifty millions of dollars.*

Railroad from Prague to Pilsen.—This important undertaking, when completed, will extend about eighty English miles. It was begun in 1825, under the auspices of the Austrian government. Its formation and management were committed to the Chevalier Von Gerstner, who spent some weeks at Darlington, a few years ago, to make himself master of our English system of road-making. During the first two years, namely from August, 1825, to December, 1827, the Chevelier was enabled, in the course of 40½ English miles, to cut no less than 696,464 cu. yd., and to construct 807,844 cu. yd. of embankments, besides laying the way with malleable rails. He erected also, during those two years, 73 bridges, from 3 to 18 yd. each, with 133 culverts; and he also made 236 wagons. The whole cost of the railway, during that period, amounted only to about £75,200 sterling. What a contrast to the way in which these things are done in England, where it would cost the whole amount on engineers, lawyers, and M.P.s before an undertaking of half the importance could be begun.—*From the "Literary Gazette."*

American Locomotive Engines.—A committee of the city and council of Baltimore have lately made a report on some experiments with an American locomotive engine they witnessed on the Baltimore and Ohio railroad. Nothing would delight us more than to see the loco's, as they are briefly called, improved in any country. We are quite satisfied there is plenty of room. But our transatlantic brethren have travelled at too much of a railway speed in such round assertions as the following: "that the artisans of this country have produced a more perfect machine than has yet been manufactured in England." What have they proved? That they have constructed an engine of 8½ tons, with coupled wheels, which would take 25¾ tons, including itself, up a plane 227 ft. a mile, or on a level not 39½ times its own weight? Why, we have had engines on the Liverpool line which have taken 44 times their own weight on a level, and therefore would take near 40 tons more than this boasted exploit.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

BRAZIL

Total Lengths and Rolling Stock: (a) Paulista & North-Western Railways

With the completion of the extension from Marilia to Pompeia on February 15, 1935, the Paulista Railway had 1,497 route km. of line open for traffic at the end of that year, 44 km. being double line. A survey is in hand for the extension of this line from Pompeia to Tupan, and the other new works of importance—the widening of the gauge between Itirapina and Baurú, and construction of a new line from Baurú to Piratininga—are well in hand.

This company's rolling-stock at the end of 1935 was made up as follows:—

Gauge, m.	1·60	1·00	0·60
Electric locomotives ...	45	—	—
Steam ,, ...	77	88	11
Coaching vehicles ...	164	147	15
Freight ,, ...	3,372	2,579	105
Inspection rail-cars ...	3	1	—

During the year 548 covered wagons were altered from 1·60 m. to 1·00 m. gauge, to cope with the goods traffic development on the Agudos branch; to the same end, two 10-coupled locomotives and 200 30-ton wagons—100 all-steel and 100 semi-steel—were acquired. Improvements on the E.F. Noroéste do Brasil (to effect which a society was formed, jointly financed by the Federal Government and the Paulista Company) went ahead in 1935; 22 locomotives were purchased, 10 of which were placed in service, and work on the Araçatuba-Jupiá deviation, and on ballasting, made considerable progress.

(b) Mogyana Railway

The Mogyana Railway possessed the following rolling-stock at the end of 1935:—

Gauge, m.	1·00	0·60
Locomotives	197	10
Coaching vehicles ...	302	19
Freight ,, ...	2,841	98

The total route-kilometrage of this line was 1,959 km. (1,874 km. 1·00 m. and 85 km. 0·60 m. gauge) at the end of the year.

Railway Construction

The Minister of Transport informed the Commercial Association of Minas Geraes that in the 1937 budget an amount of 10,000 contos had been earmarked for the building of a line to link up the Petrolina-Therezina Railway with Montes Claros in the State of Minas, the northernmost point on the Central Railway of Brazil. Its construction, which is part of the Government's general transport scheme, will provide direct rail communication between stations on the latter system and places in the State of Bahia (by means of the V.F. Federal Léste Brasileiro), as well as giving access to the frontiers of Alagôas and Pernambuco and hitherto remote localities in the northern hinterland.

The Legislative Assembly of Bahia, at the request of the Governor of the State, unanimously voted the sum of 20,000 contos to be expended on the extension of the Nazareth-São Roque Railway, the overhauling of the Bahia Navigation Company and the re-equipment of the remainder of the State transport services.

Rêde de Viação Cearense

A decree has been signed authorising this system to acquire two railcars, either of the Micheline type or whichever other make may be deemed more suitable; payment is to be effected in Brazilian currency by monthly instalments, equivalent to 40 per cent. of the gross receipts earned by the vehicles in question.

São Paulo Railway

The 34-ton Sentinel car, with high pressure boiler and Laidlaw-Drew oil-fuel burner, acquired by the above railway for use on the metre-gauge Bragantina section, went into traffic on June 1, and gave satisfactory results on its first trials. Speed has to be limited on account of the heavily graded and curved nature of the route, but the car can average 60 km.p.h. hauling a trailer with seating for 52 passengers; the car itself seats 30 passengers, and has lavatory accommodation, a small bar, and a compartment for luggage.

NEW ZEALAND

Staff Matters

Provision has been made in the Government Railways Act, 1936, whereby an independent tribunal may be set up to investigate wages and conditions affecting members of the railway service. Meanwhile the Cabinet has decided that wages shall be restored to the 1931 level as from July 1, 1936. Also, the Minister of Railways has arranged that any railway superannuitant will have the right to receive one privilege ticket order each month in favour of such of his children as are under sixteen years of age and are residing with him.

Additional Wagons and Railcars

The Minister of Railways has approved the General Manager's recommendation that the construction of 600 "La" four-wheeled wagons and 50 "Ub" bogie wagons be undertaken. These wagons are all of the open, general utility type. Half of the "Ub" wagons and 100 of the "La" wagons will be built and used in the South Island, the balance being for the North Island. The additional expenditure upon the whole order will be £204,500.

As a result of the satisfactory performance of the petrol railcar *Maahunui* [see THE RAILWAY GAZETTE, July 10 and 17.—ED. *R.G.*] on trial runs, the Cabinet has now approved of the construction of additional cars of a general utility type for passenger traffic in suitable localities. These will be double-bogie cars, considerably larger and with even better riding qualities for speedy transport than those of the *Maahunui* type. The latter type was specially designed to meet the natural restrictions imposed by the Rimutaka incline route to the Wairarapa (see illustration on p. 271).

Increased Net Revenue

The operating figures for the two four-weekly periods of the current financial year, from April 1 to May 23 (53 days) show in round figures an increase of £16,000 in net revenue over the corresponding periods of last year. Passenger revenue increased by £3,000, freight by £88,000, and miscellaneous revenue by £7,000, making a total increase in gross revenue of £98,000. Expenditure increased to the extent of £82,000 of which £37,000 was on account of the 7½ per cent. increase in wages, the balance being for rolling-stock improvements, and increased traffic and locomotive transportation costs in handling the increased traffic.

UNITED STATES

Improving on Schedule

The streamlined diesel trains of the Union Pacific and the Chicago, Burlington & Quincy Railroads between Chicago and Denver are now making the eastward journey in 15 hr. 50 min. and the westward in 16 hr. By the Union Pacific route the distance is 1,048 miles, so that the new schedule eastward works out at 66·2 m.p.h. By the Burlington route the distance is only 1,034 miles, and the average speed is 65·3 m.p.h.

Accelerations by the American railways are made continually, rather than periodically, and are generally unaccompanied by any announcement. Moreover, the practice is prevalent on some of the larger railways of running trains in advance of schedule. As an instance, your correspondent has just completed a journey from Chicago to New York on the Commodore Vanderbilt of the New York Central Railroad. On this journey, between East Cleveland and Buffalo, the train gained some 20 min. on its schedule of about 56 m.p.h. for the 178 miles, bringing its average speed up to approximately 63 m.p.h. start to stop. This gain was maintained to Harmon, where the steam locomotive is exchanged for electric, for entrance into New York. From Harmon onwards the train was permitted to lose 5 min. of the time gained, but it nevertheless was 15 min.

in advance of its schedule when it arrived at Grand Central terminal, New York.

Southern Pacific Orders High-speed Trains

The Southern Pacific has ordered from the Pullman Company two lightweight streamlined trains, to be operated by day along the Pacific Coast between San Francisco and Los Angeles. The trains will be hauled by streamlined steam engines, and will provide all the latest amenities of daytime travel.

Orders for new rolling stock by the American railways, particularly freight cars, are rapidly approaching pre-depression levels. In the first six months of the year 26,560 freight cars, 122 locomotives, and 107 passenger cars were ordered. As freight cars cost upwards of £400 each, locomotives not less than £20,000, and passenger cars at least £4,000, the outlay is a considerable one for an industry which many declared so short a time ago to be "on its last legs."

FRANCE

Increased Holiday Traffic

All workers in France are now entitled to a fortnight's holiday on full pay under the new social laws, in addition to further leisure time due to the application of the 40-hour working week. As a result the railways are making arrangements for increased passenger traffic, especially in the summer and early autumn. Organisation and supervision of workmen's holidays and leisure are under the control of M. Léo Lagrange, who has been appointed Under-Secretary of State for Sports and Leisure (Loisirs). He has requested the railways to offer facilities for travel to meet the workers' requirements.

Special Workers' Tickets, but not Available at Rush Periods

Special third class tickets may be obtained by workers during their holidays with pay, for trips of not less than 200 km. (124 miles) return and a minimum period of five days. Applications for tickets must be accompanied by an employer's certificate testifying that the applicant is on holiday and stating the period. No ticket will be valid beyond the holiday period, nor for more than 31 days. A reduction of forty per cent. is allowed on the full fares for the outward and return journey. The reduction is also applicable to the worker's wife and children.

Evidently the railways expect a large demand, as the regulations state that workers' holiday tickets will not be accepted on days when the rolling stock is fully employed to meet ordinary traffic requirements. These rush periods include month-ends and fête days. This year the days specified are: July 31, August 1, 14, 15, 16, 29, 30 and 31, as well as September 29 and 30. Holiday tickets are already on sale at stations in the Paris district and at the principal stations in the provinces. The P.L.M. is supplying printed forms for applications.

In issuing notices of these arrangements, the railways call attention to previously existing cheap fares (which offer advantages to holiday makers), and especially to the existing party tickets, which provide a reduction of 50 per cent.. to parties of ten or more persons. Some special holiday trains offer even cheaper fares and the number of such trains is to be increased this year. Workers' holiday tickets will be on sale until the end of October.

Paris to Nice and Back for fr. 175

A remarkably cheap trip to the Riviera was recently organised by the P.L.M. at the suggestion of M. Lagrange. A special train was advertised to leave Paris for Toulon, Cannes, Nice, Mentone and intermediate stations along the Riviera on August 3, returning on August 15. The return fares included: Toulon, fr. 150; Cannes, fr. 170; Nice, fr. 175; and Mentone, fr. 179. The sale of tickets began at 7 a.m. on July 29 and in little more than half-an-hour the complete accommodation on the train was sold out, leaving a long queue of disappointed applicants who were turned away. People who had never had a chance in their lives to go to the Riviera waited all night at the station for the booking office to open.

Remarkable Exodus

Many workers, who have never had a holiday for many years, are seizing the opportunity to quit Paris and other towns for the seaside and country. In some industrial districts, factories are closing down for a fortnight because of the difficulty of arranging for holidays in rotation. This plan was adopted by the textile mills of Roubaix and Tourcoing. The exodus was such that the municipalities had to organise local fêtes in an effort to retain some of the workers in the towns, because of the complaints of shopkeepers that they would lose all their customers. But French seaside places also complained, as many of the holiday makers preferred to cross the frontier into Belgium where their money would go farther because of the difference in currency values.

SWITZERLAND

Railcar Excursions

Energetic and enterprising action is being taken by both the Federal and private railways to recapture traffic this season. The three spare Red Arrow electric railcars of the Federal Railways are extensively used for excursions, some of which are regularly scheduled for certain days, as for instance a day trip from Lucerne to Lugano on Tuesdays at a fare of fr. 25, or £1 12s. 6d., including lunch, tea and a boat trip on the Lake of Lugano; the run from Lucerne to Lugano (199·4 km.) is made in 2 hr. 58 min. and the return in 2 hr. 53 min., whereas the best times by regular express trains are 3 hr. 32 min. southbound and 3 hr. 16 min. northbound. Circular trips combining several routes are also organised from various centres. The Lötschberg system uses its Blue Arrow light railcars for excursion and party traffic on its lines and, if occasion demands, the cars run through over Federal and other lines.

District Season Tickets

In several of the best-known tourist districts, the local railways and steamer companies have joined forces to issue special season tickets at remarkably low fares. These tickets entitle the holder to unlimited travel on certain lines, and reductions ranging from 10 to 50 per cent. on others. A typical example is an eight-day ticket in the Bernese Oberland, which covers travel all over the following lines: Spiez-Kandersteg; Interlaken-Bönigen; Brienz-Meiringen-Brünig (Federal Railways); Interlaken-Lauterbrunnen and Grindelwald; Interlaken-Thun tramway; Spiez connecting tramway; steamers on the lakes of Brienz and Thun; Giessbach, Harder, Beatenberg, and Niesen cable railways; and the Schynige Platte, Lauterbrunnen-Mürren, and Brienz-Rothorn railways. A reduction of 50 per cent. is granted on the Thun-Interlaken, Kandersteg-Brigue, and Spiez-Zweisimmen sections of the Lötschberg system; on the Montreux-Oberland Railway between Zweisimmen, Lenk, and Saanen; on the Interlaken-Brienz and Brünig-Lungern portions of the Federal Railway Brünig line; and on the Mürren-Allmendhubel cable railway; while lesser reductions are allowed on the remaining lines and on the various postal motorcoach services in the Oberland.

The mountain railways round the Lake of Lucerne are divided into two groups, for each of which a season ticket permits of an unlimited number of trips, and the Rhaetian Railway issues tickets covering free travel over its 277-km. system on any three days of the ten-day period of validity.

CANADA

C.N.R. Streamlined Locomotives

One of the five streamlined 4-8-4 locomotives of the Canadian National Railways, illustrated and described in our issue of June 26, No. 6400, was used to haul the centenary train from Montreal to St. Johns on July 18, and previous to the departure was on exhibition at the Bonaventure station, Montreal, next to the full-size reproduction of the *Dorchester*—one of the first three locomotives of the Champlain & St. Lawrence Railroad—which was conveyed on a flat truck in the centenary train. Pictures on page 274.

XUM

RATING OF RAILWAYS

A brief review of the development of railway valuation for rating, and an estimate of the monetary effect on the four main-line railway companies of the recent House of Lords judgment and subsequent agreement in regard to net annual values

WE recorded in our July 31 issue the Railway Assessment Authority's announcement of an agreement with the L.M.S.R., L.N.E.R. and G.W.R. in regard to the net annual values forming the basis of the local taxation of their respective undertakings in England and Wales for the period from April 1, 1931, to March 31, 1941. The agreed amounts with comparable figures are set out in the following table:—

NET ANNUAL VALUE
(In £1;000's)

	1913	1930	Railways (Valuation for Rating) Act, 1930		
			Draft Valuation Roll	First Valuation 1931-1935	Second Valuation 1936-1941
	£	£	£	£	£
L.M.S.R. ..	5,934	3,600	5,000	1,750 (*b*)	1,500 (*b*)
L.N.E.R. ..	4,701	2,600	3,500	1,100 (*b*)	1,100 (*b*)
G.W.R. ..	3,261	2,300	2,800	1,650 (*b*)	1,400 (*b*)
S.R. ..	2,589	1,840	2,180	1,077 (*a*)	(*c*)
	16,485	10,340	13,480	5,577	

(*a*) Settled by appeal to Railway and Canal Commissioners and House of Lords.
(*b*) Agreed between representatives of the major local authorities and of the railway companies.
(*c*) To be settled between Railway Assessment Authority and Southern Railway Company.

Before considering the pecuniary effect of the agreement it is interesting to recall some of the changes which have led to the large reduction of values shown by the table. The £16,000,000 in 1913 was the assessment of 120 railway companies some of them having paid dividends of as much as 10 per cent. per annum.

Pre-War Valuation

In England and Wales no machinery existed—as in Scotland—for valuing each railway system as a whole. It had to be done in parochial sections by many assessment committees at different times and on various data. The largest area subject to a single tribunal of appeal was a county, so that the standards of assessment applied to a single company might be as many as there were Quarter Sessions for the areas containing its undertaking. To test the assessment imposed by an assessment committee was very expensive and involved an enormous amount of detail in the calculation of the receipts and expenses of particular sections of line, necessitating a mileage division of the fares and charges for the transport of passenger and goods. In many parishes the customary method of calculation gave negative values, but nevertheless nominal assessments were imposed and, as no abatement in the heavily assessed parishes was allowed for the nominal assessments, it followed that the sum of the assessments exceeded the value calculated as a whole.

During the Government control of the railways from 1914 to 1921 no material change took place in the rating position of the companies and on the grouping under the Railways Act, 1921, it was agreed to be impracticable to work the old machinery. Accordingly it was arranged that until legislation set up new machinery there should be a yearly adjustment of the rateable values broadly in proportion to the rise and fall of net receipts. This arrangement, which was at first carried out on behalf of the local authorities by the National Conference of Assessment Committees and later by the Central Valuation Committee, continued in force until March 31, 1931, and reduced the total net annual value from £16,000,000 to £10,000,000.

The Railway Assessment Authority

On April 1, 1931, the Railways (Valuation for Rating) Act, 1930, came into force. This statute re-enacted the principle contained in the Parochial Assessments Act, 1836, and the Rating and Valuation Act, 1925, the annual value to a yearly tenant thus applying to all classes of rateable property; made statutory net receipts as the basis of the valuation of railways; and set up a new authority called the Railway Assessment Authority consisting of a chairman and nine other members. The Chairman is an experienced lawyer appointed by the Lord Chancellor and the other members are appointed by the Minister of Health, three at his discretion and six by him on the recommendation of the following bodies: L.C.C. County Councils Association, Association of Municipal Corporations, Metropolitan Boroughs Standing Joint Committee, Urban District Councils Association, and Rural District Councils Association. The duty of the authority is to make quinquennial valuations of the railways, the first valuation to come into force on April 1, 1931, the second on April 1, 1936, and so on.

The basis of the first valuation was the average net receipts for 1928 and 1929 and that of the second valuation the average net receipts for 1930, 1931, 1932, 1933, and 1934. The first valuation of the four companies by the Railway Assessment Authority and inserted in the draft valuation roll aggregated £13,480,000 or approximately the mean of the total figures of 1913 and 1930.

The valuation of the Southern Railway was the first to be completed and this on appeal to the Railway & Canal Commissioners was reduced from £2,180,000 to £1,077,131. The principal matter in dispute before the Railway & Canal Commissioners was the method of valuation, the Railway Assessment Authority attempting to set up a new method which both the Commissioners and the House of Lords declined to adopt. Had they done so railways would have been treated differently to all other public utility undertakings. At the end of their judgment in the Southern Railway case the Commissioners stated that the figures and percentages they had found must not be taken as providing a set of mathematical formulæ to be applied in every case. "Each case must depend upon its own facts." Notwithstanding this the Railway Assessment Authority entered the net annual value of the L.N.E.R. undertaking in the draft roll at nil, thinking presumably to influence the judgment of the House of Lords.

The House of Lords, however, said that its function was to interpret the law, and to ignore the effect of its

interpretation. The ultimate result of the action of the Railway Assessment Authority in the L.N.E.R. case could not have been anticipated, because it was to bring the local authorities and the railway companies directly together and to settle the three outstanding valuations at a total of £4,500,000 for the first period and of £4,000,000 for the second period.

The Southern Railway Company's figure as determined by the Courts for the first valuation was £1,077,131, making for the four companies a total net annual value of £5,577,131. The Southern Railway assessment for the second period has not yet been settled; it was not the subject of negotiations with the local authorities and therefore remains to be dealt with by the Railway Assessment Authority.

The 1931-36 Valuation

As the first valuation applies to the five years ended March 31, 1936, its chief interest lies in the amounts of the repayments due to the companies. These cannot be calculated exactly at this stage for various reasons, one being that the net annual value calculated as a whole is when apportioned subject to deductions in many places to arrive at the rateable value upon which the rates are levied. A total of £12,000,000 is believed to be an approximate figure of the amount of the repayments due to the four companies for the five years to March 31, 1936. Of this sum £3,000,000 will be recoverable from the local authorities and £9,000,000 from the Freight Rebates Funds.

There must be appreciable differences in the average rate poundages of the four companies; the highest is that of the G.W.R. owing to its large interests in the heavily rated area of South Wales, and the lowest the Southern Railway. Each company's share of the £3,000,000 may be as follows:—

	£
L.M.S.R.	1,175,000
L.N.E.R.	975,000
G.W.R.	450,000
S.R.	400,000
	3,000,000

Three times those sums will be repayable out of the Freight Rebates Funds.

It is understood that for some time the local authorities have been providing for their liability to the railway companies and that in only a few cases will there be any difficulty in at once meeting the claims of the companies. The grants which the authorities received from the Government in respect of the £9,000,000 paid by the companies in Freight Rebates is not affected by the reduction of railway assessments.

The 1936–41 Valuation

With regard to the second valuation, which will have effect for the quinquennial period April 1, 1936, to March 31, 1941, the net annual values have yet to be apportioned, and, as a factor in such apportionment is the relative values of the traffic on the various sections of line immediately before the quinquennial period, a transfer of assessment from one area to another is possible with consequential increase or decrease of rate payments.

However that may be, the payments for the current year (to March 31, 1937) will certainly be based on the old assessments and necessitate further repayments by the local authorities. What those will be may be estimated roughly thus:—

	£
L.M.S.R.	275,000
L.N.E.R.	200,000
G.W.R.	130,000

Again three times these amounts would normally be recoverable from the Freight Rebates Funds, but the position may be affected by the difference in the yearly period of the rates and that on which the Freight Rebates are calculated. Rates are estimated for the year from April 1 to March 31 following, whereas the freight rebates year ends on September 30, so that presumably the rebates for the year beginning October 1 next should be based on estimates of the rate relief in relation to the agreed assessments. In that case only one and a half times the excess payments will have gone into the Funds and be recoverable by the companies.

An outstanding feature of the arrangement which disposes of the L.M.S.R., L.N.E.R., and G.W.R. cases is that it was the result of negotiations by representatives of the associations of local authorities which had already six nominees on the Railway Assessment Authority. It is curious that the latter authority should itself have failed to negotiate with the companies. Had the attitude of this authority been different, the probability is that an agreement could have been come to years ago with a substantial saving of time and expense.

It has been suggested that the Act which set up new machinery for the valuation of the railways has been abandoned. This appears to be so in regard to the present negotiations, but it is hoped that such is only temporary, and that what has been permanently abandoned is the idea that Acts are intended to be applied meticulously, with frequent recourse to the Courts, and not to be interpreted by reasonable people in a reasonable way.

Welding in Locomotive Fireboxes

During the discussion on a paper by Mr. A. J. Poole on "Locomotive Boiler Proportions and Design," read at a meeting of the South American Centre of the Institution of Locomotive Engineers, interesting facts concerning the experience of the Central Argentine Railway with copper and steel fireboxes were given by Mr. P. L. Falconer. He said that steel fireboxes were first introduced on that line between 1905 and 1908. At the outset the results were satisfactory, especially in the good water districts, but later trouble developed by cracking of the plate between the rivet holes and the edge of the plate at the firedoor, tube plate and back plate in the fire area. In 1912 an extensive reboilering programme was put in hand, copper being chosen in place of steel for fireboxes. This programme was, however, negatived by the fact that copper was almost unobtainable during the war, and welding was resorted to first to weld the cracks in the steel flanges, and afterwards to weld in corner patches. The elimination of the riveted seam proved so successful that by 1923, 44 steel fireboxes had actually been reclaimed from the scrap heap and put back into service. Since then electric arc welding replaced oxy-acetylene, and the design of firebox plates now familiar on other South American railways was adopted. At the present time 74 per cent. of the locomotive boilers on the Central Argentine Railway are fitted with welded steel fireboxes and steel tubes. The economic results are perhaps best shown by the fact that the direct boiler maintenance costs have been reduced in the past ten years to 43 per cent. of the average for the three years 1924-26.

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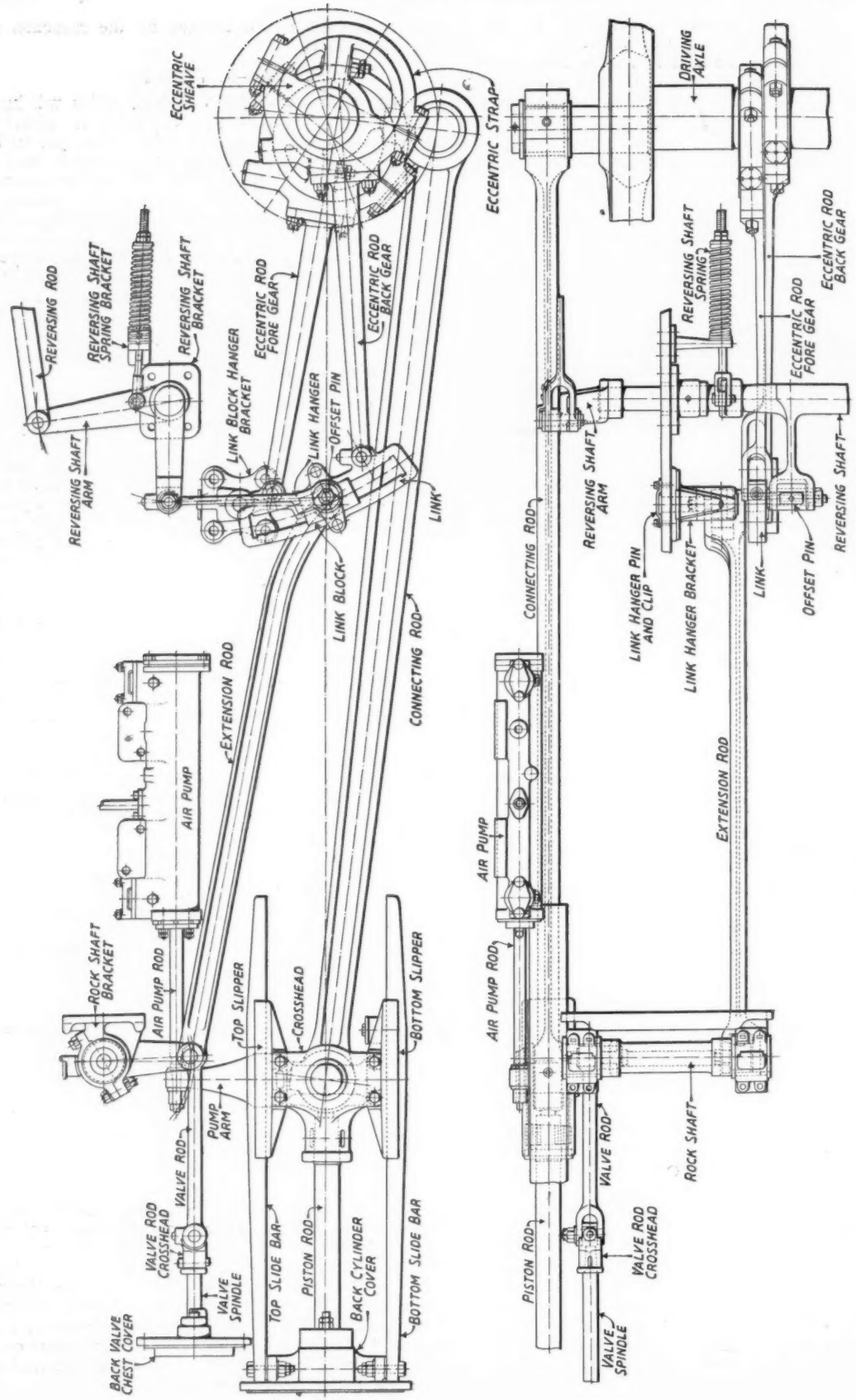


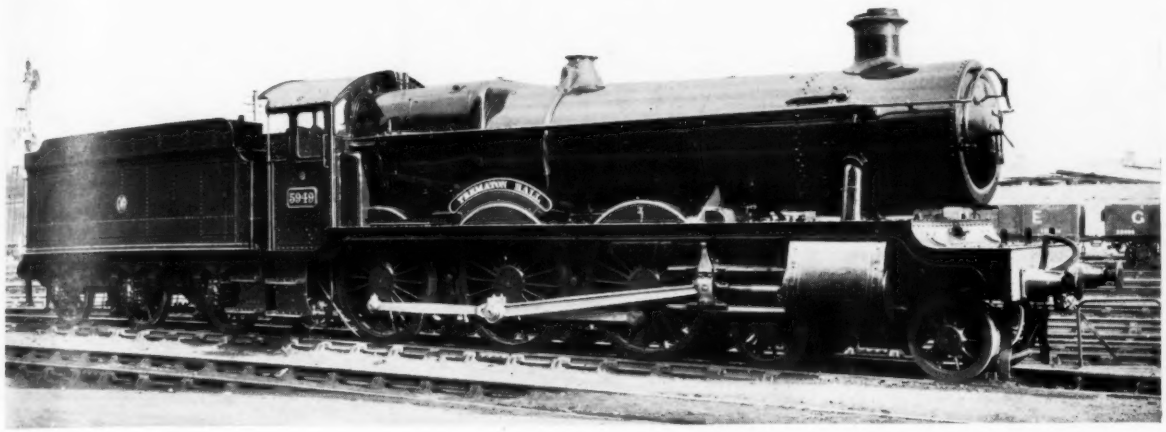
Fig. 1—Diagram of Stephenson valve gear for "Hall" class engine, G.W.R.

MACHINING A LOCOMOTIVE VALVE GEAR

MACHINING A LOCOMOTIVE VALVE GEAR—I

Operations involved in the production of Stephenson link motion for G.W.R. "Hall" class express engines

By K. J. COOK, Assistant Locomotive Works Manager, Swindon



THE production of a set of locomotive valve gear requires many interesting methods of machining. The component parts, on the whole, are large and bulky, and the small number of each required makes full mass production uneconomical. A great deal, however, can be done by jigging to eliminate marking off and make the finished articles interchangeable. Particularly is this the case where standard classes of engines are designed with some parts interchangeable on two or more classes, or if not interchangeable, then varying only in some dimensions for which the jigs can be adapted to cover more than one class.

It is proposed in this article to deal with the Stephenson type of valve gear as used on the "Hall" class engines of the G.W.R. There are now 160 of these engines in service, which have been built over a period of six years, and it is, of course, well known that the forerunner of these was an experimental conversion from the "Saint" class which has the same wheel and general arrangement, but coupled wheels 8½ in. larger in diameter. Hence a number of component parts are similar in design to those used on the "Saint" class engines and, in fact, on most of the standard 2-cylinder classes developed in the first decade of the present century.

Stephenson Valve Gear

Much might be written concerning the relative merits of valve gears of the Stephenson or Walschaert type. A good layout can be obtained with the former type on engines of this cylinder arrangement, which provides easy accessibility together with good wearing qualities. The bulk of the gear lies between the frames in a space not required for other parts, and it also has the benefit of leaving the piston crossheads, coupling and connecting rods, free from valve gear attachments and, therefore, removable without any further dismantling.

A diagram of the general layout of this gear is reproduced herewith, from which it will be seen that the drive is obtained from two eccentrics between the frames and the motion is finally transmitted outside to the valve spindle by means of a rockshaft. Both arms of the rockshaft are on the same side of its axis and, therefore, it is not a rocker within the sense of affecting the open or crossed rod question. Its function is to alter the vertical plane of the valve motion. The component parts are indicated on the diagram and these names will be used throughout.

All the machining is carried out in the A.M. shop, which is the machine and fitting portion of the "A" group of shops, comprising under its 11-acre roof, erecting, boiler, wheel, machine, and fitting shops. Briefly, the principle followed is to provide, as far as possible, jigs which will set components in correct position and hold for machining, which is carried out either to fixed or micrometer gauges. As the motion is primarily derived from the eccentric sheaves, these will be the first components to be dealt with.

Twin Eccentric Sheaves

The eccentric sheaves are of the twin type in which the pair of sheaves required for operating the valve of one cylinder is formed in two castings split through the centre line of the axle seat.

The first machining operation consists of facing the outer flat surfaces of the castings. This is carried out on a boring mill. The pair of castings is bolted to the table by clamps on the lower sheave, assisted by stops, the cast surfaces of the portion which will form the joint roughly butting together and the upper sheave approximately central with the table. A small amount of packing may be necessary in order to set the upper surface horizontal. A single cut is taken across the face of the upper sheave, leaving about ½ in. to be removed after boring. The sheaves are then reversed and bolted down on the first machined surface, and a similar cut taken across the second face.

The joint is now machined on a shaping machine, the halves being bolted successively to an angle plate and the surface machined to the designed height from the lower face of the boss of the jointing studs, allowing $\frac{1}{16}$ in. for facing off the boss after the drilling operation. The joint includes a locating step, the width and depth of which

XUM

are shaped to a plate gauge catering for both the projecting and recessed halves, the two steps being formed approximately equidistant from the bore. The roughing and finishing cuts are made by a round-nosed tool, and the steps finished with a square cut. The sheaves then pass to a radial drilling machine for drilling the holes for the jointing studs. A plate jig recessed one side and projecting on the other engages in the shaped steps and thereby ensures correct location of the drilling in two halves. The bushes of the jig accept a drill of the diameter of the tapping hole. One-half is tapped at the same setting and also recessed to take the collars of the studs, and the other half is opened out to full size of the body of the stud after removal of the jig. The two halves can now, after insertion of the two studs in one half, be assembled together, but at this stage a strip of tinplate, 0·015 in. thick, is inserted at the joint in order to ensure a full grip of the sheaves on the axle later. The position of the bore is marked off on the bench and a check made to see that the sheaves will turn up to the requisite diameter, but marking of this is not required.

Fig. 4—Turning the first sheave of a pair on jig

Boring is now carried out and finished to the standard diameter of the axle body, after which the finishing cut is taken across the upper surface. No jig is required for the setting for boring, as the lower sheave is placed on three packing pieces of uniform thickness to give tool clearance at the bottom of the bore, and clamped to the table. The marking for the bore is set to a vee-pointed tool, while the sheaves are loosely bolted to the table.

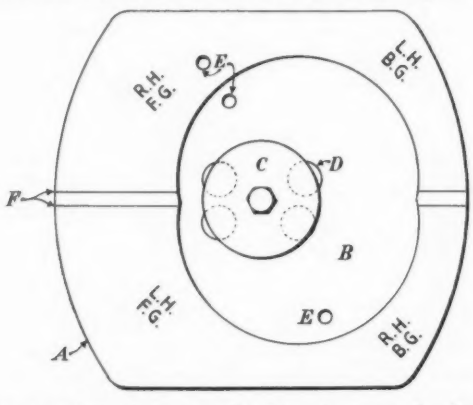


Fig. 3—Plan of turning jig for twin eccentric sheaves

Jig Setting for Throw and Angle

A composite jig is used on the same boring mill to turn each of the four sheaves forming the set. A plan of this jig is shown in Fig. 3, while it can also be seen in use on a boring mill in the following illustration. The jig consists of a cast iron base plate *A*, in which are four holes *D*, which are engaged in turn on a spigot inserted in the hollow spindle of the boring table. Each hole is at the centre for turning the appropriate sheave, viz., right hand fore gear, left hand back gear, &c. At *C* is fixed an expanding collet at the axle centre to accommodate the bore of the sheave which grips the latter by the tightening of the central bolt. Before tightening up, the joint of the bottom sheave is set to the appropriate one of the scribed lines *F*. The sheave is thus set at the correct angle relative to the other one and also at the designed throw. When the former sheave of the pair is being turned, the lower part rests on the top of the baseplate and to assist the clamping a pillar is inserted in whichever of the three tapped holes *E* is suitable, and a set bolt adjusted to the casting of the lower sheave. The baseplate is recessed a quarter of an inch over the area *B* of the two intersecting circles, so that when dealing with the second sheave the previously turned one will drop into the recess and accomplish a positive setting, which also makes the joint line coincide with *F*.

The crown of the sheave is formed to a plate gauge locating from the upper face. The keyway is placed in one half of the sheave, midway between the joint, and is slotted to gauge.

Eccentric Straps

The eccentric straps are of mild steel, the large or butt ends being drop-stamped. The small ends are made from D-section bar cut off to the requisite length, upset at each end to form the lug for the joint, and bent to the required radius.

Machining of the straps is completed entirely by jig without any marking off, and is begun on a planing machine, where a jig is arranged to accommodate twelve of either butt or small ends at a time. The joint surfaces are planed while the underside of the lugs rest on horizontal tie bolts supported from three vertical stands on the planing table, the tie bolts also effecting the main clamping. In addition to planing horizontally across the upper joint surfaces, vertical cuts are made downwards inside the bore for about half an inch, and of equal thickness each side, in order to provide a setting for the drilling jig for the joint holes. The drilling and reamering

Fig. 5—Planing eccentric strap joints

of these holes is the next operation, the reamered hole providing the setting for boring and facing, and the undersides of the lugs are faced back to the requisite depth by cutter bar and cutter.

Facing and Boring Eccentric Straps

The holding jig for boring and facing consists of two brackets, supporting horizontally in each a turned bolt. The brackets are first set diametrically opposite each other on the boring table, equidistant from the centre of the table, by a setting plate from the central bore of the table. The butts and small ends are now mated up and one of each entered by the reamered holes on the horizontal bolts, on which they are tightened to butt up to each other, except for two distant pieces between. The ferrule seen on the setting bolt between the lug of the small end strap and the left hand foot of the bracket can be varied to accommodate other standard straps. The bolts being a good fit in the straps, effect a horizontal setting of the straps on the boring machine but additional support is provided by placing small screw jacks underneath the middle of each half. The upper surface is faced in two cuts, the roughing cut removing about $\frac{1}{8}$ in. of metal and the finishing tool is flattened to take a light cut and leave a good finish. Boring begins with a cut down the width of strap and then recessing in to remove the centre and to form the flanges. Three roughing cuts and one finishing cut are required to remove the $\frac{11}{16}$ in. of metal necessary. The depth and width of the recess are greater than those of the crown of the sheave in order to accommodate a whitemetal liner. After completing the bore the strap is reversed in the jig for facing the remaining side.

The large end straps are then batched up again on the planing machine, but this time with the joint surfaces against an angle bracket bolted to the table and clamped by the joint lugs and their support assisted by the upright members of the bracket. The butts which will receive the eccentric rods are now horizontal and are planed to correct height, after which a vertical cut across the top of the oil box is taken at the same setting. It is now necessary to drill the bolt holes for attaching the eccentric rods, for which the straps are clamped to an angle plate on a radial drilling table and drilled through a jig. The straps are then turned through 90° and set for drilling out the oil reservoir. The oil pipe is left from the solid and, therefore, after the entry of a pilot drill, a drill with a half blade recessed to the radius of the outside of the oil pipe is fed to the required depth. The central pipe is then drilled with its small hole, and the oil box tapped to take its cap. The half round ends of the lugs of both halves are machined either by slotting or milling.

Fig. 6—Boring eccentric straps. The ferrules on the turned bolt between strap and left hand jaw of bracket are changed when dealing with other classes of straps

The bore of the strap is recessed by cutter to accommodate the cheesehead of the bolts.

The white metal liners are chill cast in halves and can be fitted into the eccentric straps without any machining, only a slight easing of the faces being necessary. They are clamped in position and hammered home. They are cast so that the ends will project a little beyond the jointing faces of the straps, and are rasped off flush. Bronze distance pieces machined all over by shaping are inserted, and the two halves are bolted up together for boring the white metal liners. The method of setting for this is similar to that for the boring of the sheaves, except that the setting point is the inner surface of the upper steel flange. Vertical boring machines lend themselves in these cases to easy setting. While the clamps are finger tight and the table is rotated by hand, the strap can very quickly be centred and then tightened down. One roughing cut with a round-nosed tool and a finishing cut by flattened tool can be taken at high cutting speed.

A telescopic gauge rod is used for machining to the required size as it is impossible to enter a fixed gauge rod. The stop on the telescopic gauge is set to allow the rod to extend to the diameter of the sheave, and when in position one leg of the gauge is allowed to swing through an arc $1\frac{1}{8}$ in. in length. This provides the bearing tolerance when the strap is assembled on its sheave.

Eccentric Rods

Eccentric rods are produced in the rough as forgings, and each one is marked off to centre lines and finished dimensions in order to check for alignment and margin of metal. This being correct, the pin hole of the rod is drilled from the marking off and reamered parallel to fit a turned bolt which forms part of the jig for subsequent milling. The drilling is carried out on a fixed head machine on which the rod is set by scribing block to the marked lines and clamped to the table. At the same setting, after drilling, reamering and facing, a trepanning tool is used to form the boss and undercut to the correct depth. The rod is reversed to allow the opposite side to be recessed. Subsequent milling blends into the trepanned surface.

For milling the edges of the rods, which is the next operation, two rods are held by the reamered pin holes in a bracket and set horizontally by scribing block. The lower edges of the forgings near the feet rest on an angle bracket which can be moved along the tapering rod until the correct setting for the upper edge is secured. The rods are then packed under the feet and clamped to the table for milling. For dealing with the flats a similar setting is employed, except that the jaw is placed on a pedestal bracket and tightened down against the boss of the rod, one rod at a time being dealt with. After altering the position of the clamps to the milled flats and edges in these two operations, the flats and edges of the feet of the rods are milled. A vertical milling machine is used for machining round the bosses of the pin holes and also for the end surface of the foot, which is finished to a length gauge from the pin hole.

In order to cut out the jaw of the rod this is marked out on the milled surface and a hole is drilled and reamered out at the end of the slot to a diameter of the full width of the slot. The mass of the metal remaining is removed by two 13 in. × $\frac{3}{4}$ in. saw milling cutters mounted on a horizontal spindle with distance piece on the arbor between the cutters so that $\frac{1}{8}$ in. of metal will remain on the inside of each jaw. This is finally removed on a vertical milling machine to blend into the previously reamered hole. The holes in the feet of the rods are drilled from the same jig used for drilling the corresponding holes in the butts of the eccentric straps.

Valve Gear Joint Pins

The pin joints of the eccentric rods with the quadrants are representative of the joints throughout the gear. The pins are parallel on the working portion, but each end forms a continuous taper. In the case of this particular joint the hole for setting for milling is reamered to $1\frac{3}{8}$ in. In order to finish after all other machining is completed, one jaw is redrilled to $1\frac{7}{16}$ in. and then a taper reamer is put through both holes to finish the bottom at $1\frac{13}{32}$ in. and the top at $1\frac{33}{32}$ in. The pins are turned from bar in a turret lathe, the two taper portions being formed by wide flat tools, leaving a grinding allowance. After hardening, the body is ground standard size to 1·5 in. and then the work head is swung to the desired angle and both portions of the taper ground to size. The bronze bushes in the links are turned for external press fit, but a broaching allowance of 0·008 in. is left in the bore. The bushes are pressed in on a vertical Lucas belt driven friction press and are broached and burnished to 1·505 in. on the same press by one broach, the last three rings of which have rounded edges to burnish and not to cut.

The second part of this article, which we hope to publish next week, deals with other operations concerned with the production of the valve gear, including the manufacture of parts by oxygen flame cutting, and the machining of links, shafts, and other components.—ED. *R.G.*

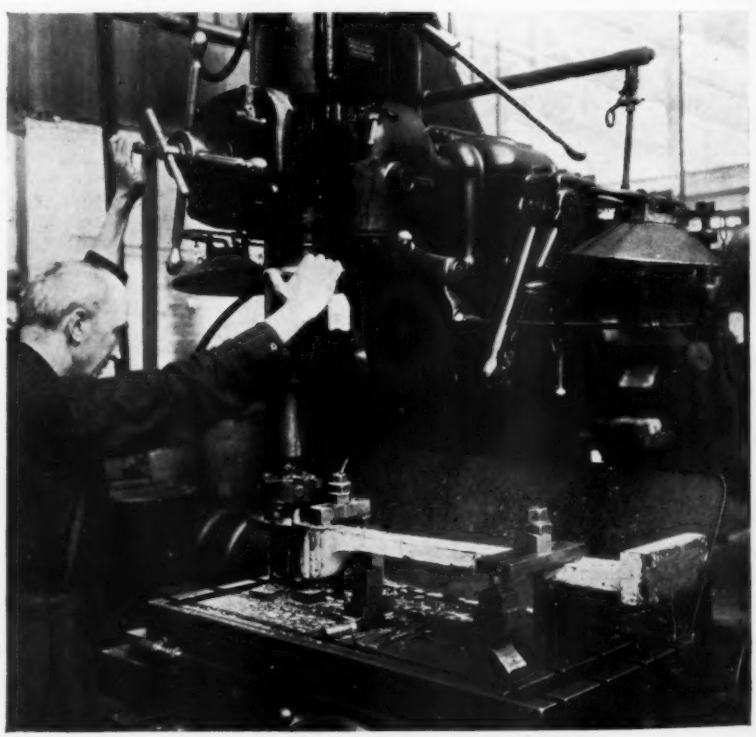
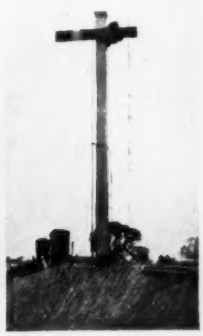


Fig. 7—Forming boss and recessing eccentric rod fork end

Typical passenger and goods trains. The passenger service, of course, is now withdrawn

Quainton Road junction. Met. and C.C. Joint line on left, and L.N.E.R. main line on right



Left: Quainton Road. Centre: Down outer home signal, Verney Junction. Right: Level crossing at Winslow Road station

Verney yard signal box, looking south

Near summit of Hogshaw bank

THE VERNEY JUNCTION LINE (*see news article on page* 278)

Fig. 1—Rendsburg bridge, showing main suspension and cantilever girders

Fig. 2—Transporter bridge suspended below double-track railway main span

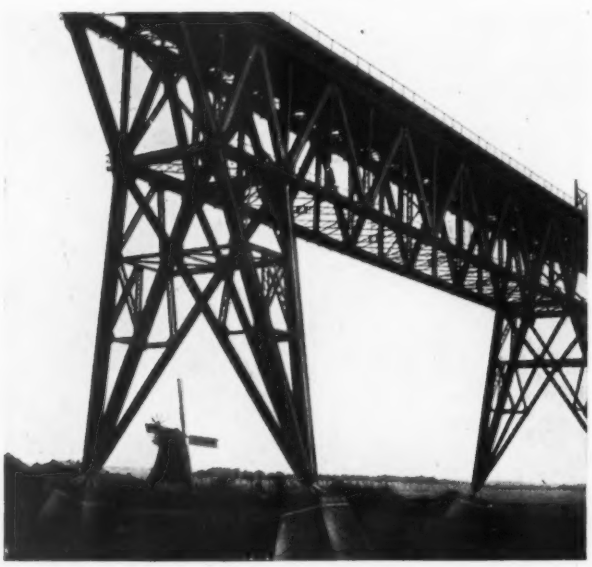


Fig. 3—Hochdonn bridge, showing deep lattice base

Fig. 4—The widely straddled legs of the Hochdonn bridge with their universal joints

Fig. 5—(left)—Grünthal bridge, with inward-leaning segmental arch girders carrying single line and roadway decking

STEEL BRIDGES ON THE KIEL CANAL

(See article on facing page)

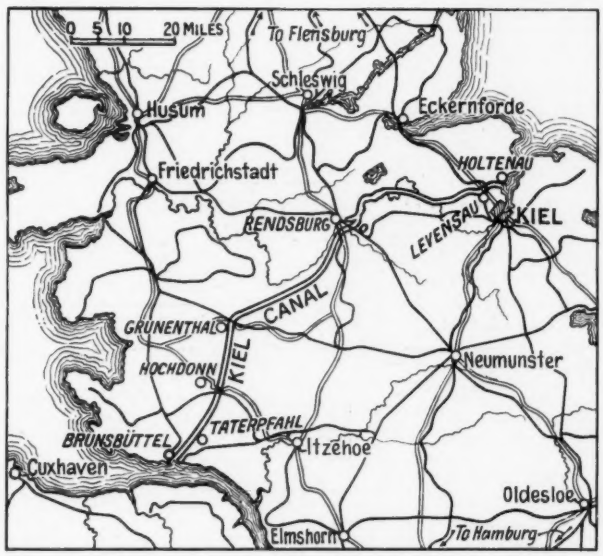
STEEL BRIDGES ON THE KIEL CANAL

A brief illustrated description of the various high-level bridges and approach viaducts carrying railways and roads over the canal

THE Kiel Canal was completed in 1896, but the launching of the first British Dreadnought ten years later severely restricted its use for German naval purposes, as battleships of equal armament and size were bound to have a greater draught than 29 ft., which was the depth of the canal. The reconstruction immediately undertaken by the German Government involved not only the widening and deepening of the waterway and the enlargement of the locks at Brunsbüttel and Holtenau, but also the reconstruction of the railway crossings. The original canal, 213 ft. in width, was spanned at Rendsburg by two swing bridges, each carrying one track of the Rendsburg-Neumünster line. At Grünthal, a single-span arch carried the West Holstein line and a road for general traffic. The Kiel-Eckernforde road and the Kiel-Flensburg line crossed on another single-span bridge at Levensau, about four miles from the Baltic entrance to the canal. A fifth crossing was that of the Elmshorn-Hvudding line at Taterphahl, three miles from Brunsbüttel at the North Sea end, by Cuxhaven.

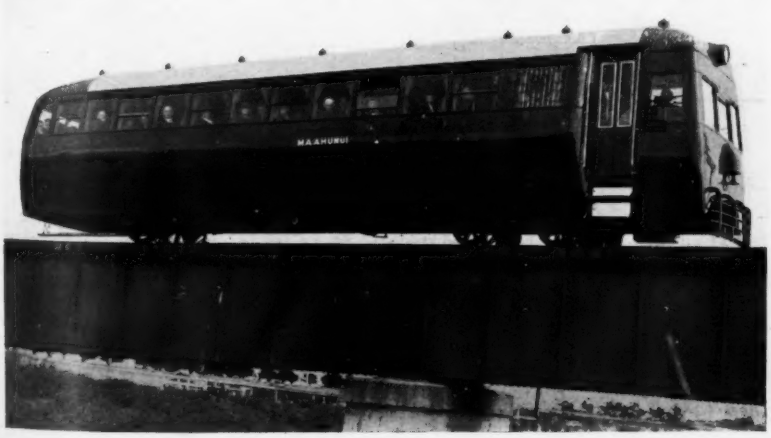
The bridges at Grünthal and Levensau were already high-level bridges, allowing a free passage for ships of some 130 ft. between the underside of the bridge and water level, and the new bridges for the Rendsburg and Elmshorn lines were also to be at the high level. As the country through which the canal passes at these points is flat and marshy, it was necessary in each case to construct gigantic approach gradients. At Rendsburg these are nearly three miles long, starting with spiral earth embankments. At the points where these return upon themselves begin the steel viaducts, some 2,500 metres in length. The great central span across the canal is in the form of a steel suspension girder, with two cantilever bays connected to the approach viaducts (Fig. 1). From the underside of the deck, carrying the double railway track, is suspended a transporter bridge for road vehicles and foot passengers (Fig. 2). Supports are carried on massive foundation blocks, and rest on steel universal ball and socket joints, which gives the structure the dramatic appearance of the engineering feats of mediæval builders.

The bridge at Taterpfahl was replaced by the high-level one at Hochdonn. This has approach ramps and viaducts similar to Rendsburg, but is some 300 metres shorter. Here each alternate bay of the viaduct is cantilevered out from the deep lattice girders of the adjoining bays (Fig. 3). The supporting legs straddle widely, and each is carried on a universal joint (Fig. 4). The Haltenau bridge is similar in general design, but the supports of the central span across the canal are exceptionally slight, being constructed with universal joints at both top and bottom. Of the two single-span bridges, that at Grünthal is the more interesting. Here the single-line railway and the road bridge occupy the same track, and the decking is supported by two segmental girders, which are not set vertically but lean towards one another (Fig. 5). The æsthetic effect of this purely engineering device is very pleasing; the bridge looks as stable as it really is.

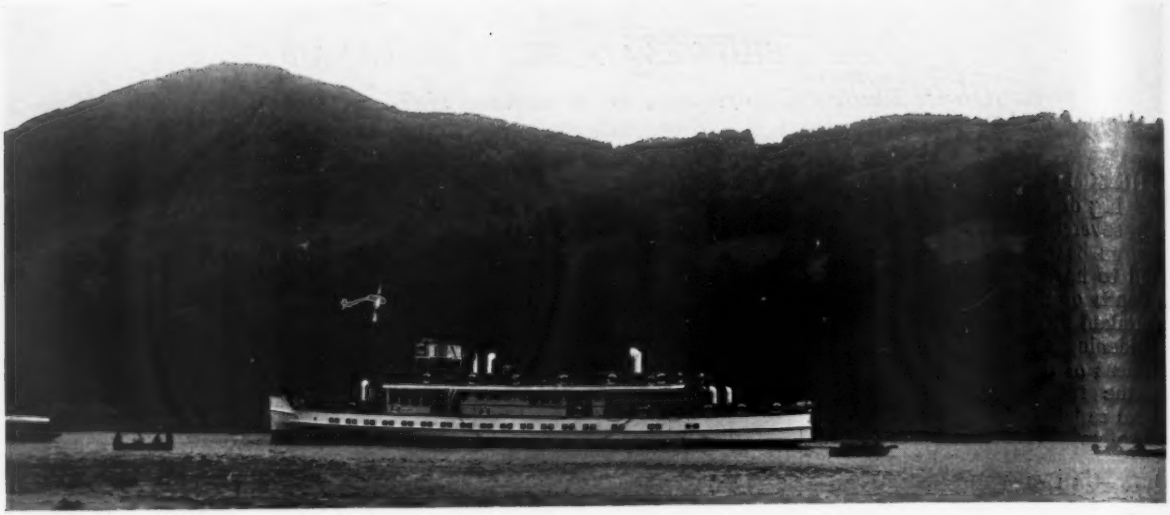


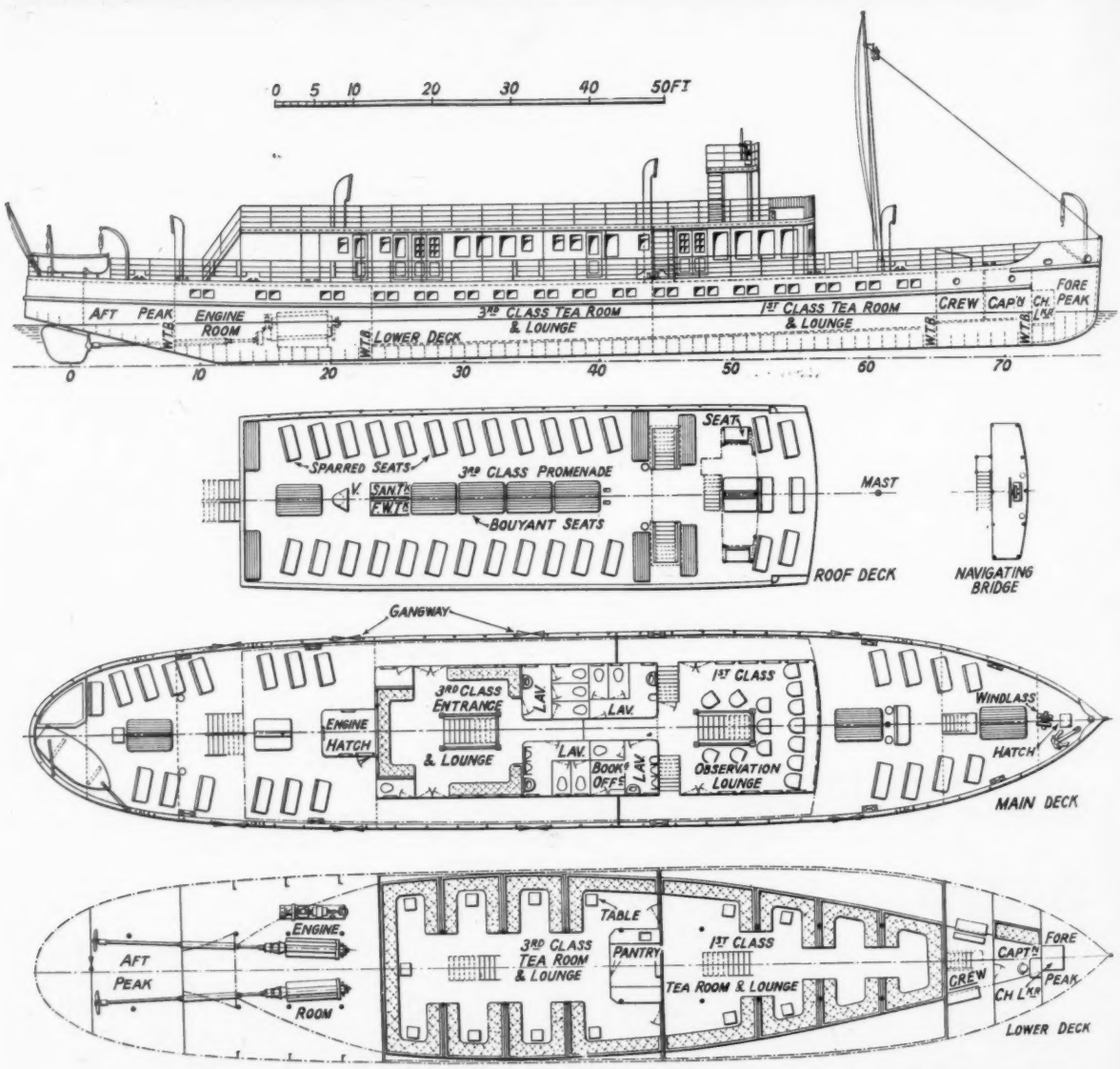
Sketch map showing position of Kiel bridges

Six-wheel Petrol Railcar "Maahunui," New Zealand Government Railways



This new railcar, which is fitted with a six-cylinder Leyland engine and torque converter, is 50 ft. in length and seats 49 passengers, was briefly described in our issues of July 10 and 17, and is again alluded to on page 260 of this current issue. It is specially designed to work over the 1 in 14 Rimutaka incline, has an all-welded underframe of unusual type, and is replete with baggage space both in and below the floor of the car, and every comfort, including tubular framed bucket seats, warmed air and fan-circulated heating in connection with special roof ventilation, and also wireless





General arrangement of the diesel-engined L.M.S.R. passenger launch "Teal" for Lake Windermere service

L.M.S.R. PASSENGER LAUNCH "TEAL"

A diesel-engined vessel built by Vickers-Armstrongs Limited at Barrow-in-Furness, and re-erected at Lakeside for service on Lake Windermere

(*See illustrations on opposite page*)

WE recorded in our issue of July 10 that the new diesel-engined passenger launch *Teal*, which was built for the L.M.S.R. by Vickers-Armstrongs Limited at Barrow-in-Furness, and conveyed in sections by rail to the slipway at Lakeside, had been launched there on Saturday, July 4. This twin-screw vessel, built under Board of Trade survey for a Steam 5 (summer daylight) passenger certificate, is of 230 tons displacement. She has three decks—lower, main and roof—and accommodation for 800 passengers. On the lower deck is the first class lounge and tea room, and also a similar lounge for third class passengers, with an all-electric pantry arranged for service to each lounge. Doors have been arranged in the bulkhead dividing the first and third class tea rooms so that both tea rooms and lounges may be used for one class if so desired. The walls of the third class lounge are panelled in mahogany, and those of the first class lounge in polished oak. At the forward end of the lower deck is a mess room for the crew and accommodation for the captain.

L.M.S.R. launch "Teal" being re-erected at Lake Windermere

A main deck extends the full length of the vessel, on which is built a steel deckhouse amidships, embracing the entrances to the first and third class lounges. Lavatory accommodation has also been conveniently arranged for the passengers within this deckhouse, and at the forward end is an observation lounge for first class passengers, provided with large windows, so that the passengers may have an uninterrupted view of the lake and its surroundings. A substantial elm belting has been carried the full length of the ship in the vicinity of the main deck. Mooring bits and fairleads have been provided, as a vessel of this class is constantly calling at piers. There are four gangway openings in the rails, port and starboard, on the main deck, for the speedy handling of passengers. The roof deck extends about 75 ft. over the midship portion of the ship, giving a large open space to which passengers have unrestricted access. Ample seating is provided on this deck, and the seats are arranged at a convenient angle to enable the passengers to have a comfortable view athwartships as well as ahead.

The life-saving appliances consist of a Class 3 boat, buoyant seats, and lifebuoys. Fresh water is laid on to all wash-basins; electric light is installed throughout the vessel; and ample natural ventilation has been arranged. The principal particulars of the *Teal* are as follow:—

Length, b.p.	135 ft. 0 in.
Length, overall	141 ft. 9 in.
Breadth, moulded	25 ft. 0 in.
Depth, moulded	9 ft. 3 in.
Load draught, mean	4 ft. 9 in.
Speed	11 knots.

The propelling machinery consists of two eight-cylinder, four-stroke cycle, single-acting diesel engines, manufactured by Gleniffer Engines Limited, Glasgow, and each capable of developing 160 b.h.p. at 900 r.p.m.; the engines are fitted with reducing gear, giving a propeller speed of 480 r.p.m.

Every consideration has been given to the comfort of passengers, and the representatives of the L.M.S.R. and of Vickers-Armstrongs Limited have been closely associated in the preparation of the general layout and design. Now that the *Teal* has been placed in service on Lake Windermere, the L.M.S.R. fleet there consists of five vessels.

Modernisation of the L.N.E.R. Shenfield-Southend Line

Numerous improvements to its Southend-on-Sea branch are to be carried out by the L.N.E.R. under the scheme for Government-assisted loans. The Southend branch, which leaves the main Eastern Counties line at Shenfield, is 21¼ miles long and has six intermediate stations; there is a heavy residential traffic between the branch line stations and London, and a large excursion traffic to Southend. To modernise the branch and provide adequate facilities for increased traffic, the L.N.E.R. proposes to instal colour-light signalling between Shenfield and Southend; to lengthen the platforms at all the intermediate stations on the branch; and to equip Hockley and Rochford stations with electric light. At Southend passenger station the circulating area is to be enlarged, two new train indicators are to be provided, and improvements are to be made to the lavatory accommodation. Ten additional sidings are to be laid down; at the locomotive depot the improvements include increased siding and engine pit accommodation, replacement of the existing 50-ft. turntable by a 70-ft. power-operated turntable, the provision of a 100-ton mechanical coaling plant, new offices, stores, and mess room, and the installation of electric lighting.

XUM

Three of the 227 new mixed traffic 4-6-0 locomotives now being built by Sir W. G. Armstrong & Co. (Engineers) Ltd. for the L.M.S.R. leaving that firm's Scotswood works for despatch to Carlisle

Canadian centenary exhibition (left) at Bonaventure station, Montreal, referred to in our Overseas columns on page 261, where the centenary train (right) is also mentioned. The first new C.N.R. 4-8-4 streamlined locomotive and the reproduction of the "Dorchester" mounted on a flat truck may be seen in both the above illustrations

RAILWAY NEWS SECTION

PERSONAL

L.N.E.R. Staff Changes

It is officially announced that Mr. Thomas Hornsby, Divisional General Manager of the North Eastern Area of the London & North Eastern Railway, has tendered his resignation, upon his appointment as Chairman of the Durham Coal Sales Control Committee. The directors of the L.N.E.R. have accepted Mr. Hornsby's resignation, which will take effect as from August 31.

To succeed Mr. Hornsby, the directors have appointed Mr. C. M. Jenkin Jones, Superintendent (North Eastern Area) and Freight Rolling Stock Controller, to be Divisional General Manager, North Eastern Area.

The directors have also appointed Mr. S. T. Burgoyne, M.V.O., O.B.E., Passenger Manager, North Eastern Area, to be Superintendent of that area, and Freight Rolling Stock Controller, in succession to Mr. Jenkin Jones.

It is also officially announced that Mr. James B. Dunlop will succeed Mr. N. Ridley as the L.N.E.R. Advertising Manager's Scottish Area Representative. Mr. Ridley, on attaining the age limit, will retire in September.

Also that Mr. G. G. Goodings, Assistant to the Cartage Manager, Southern Area, has been appointed District Goods & Passenger Manager, Ipswich, in succession to Mr. P. S. Ludlam who has retired from the service.

Mr. Thomas Hornsby, who, as announced above, has been appointed by the Executive Board of the Durham District (Coal Mines) Scheme, 1930, to be the Independent Chairman of the Durham Sales Control Committee and is, therefore, retiring from the position of Divisional General Manager, North Eastern Area, L.N.E.R., is a solicitor by profession. He served his articles with the late Mr. F. T. Steavenson, Town Clerk of Darlington, and achieved distinction in the Law Society's examination in November, 1894, when he was placed first in honours for the whole of England, and was awarded the Clement's Inn, Daniel Reardon and Law Notes prizes. Mr. Hornsby entered the Solicitor's Department of the old North Eastern Railway in 1895, and was appointed Rating Solicitor in July, 1907, a position he held until the time of the amalgamation in 1923, when he was made Goods Manager, North Eastern Area, L.N.E.R. It was in September, 1928, that Mr. Hornsby was appointed to succeed the late Mr. George Davidson as Divisional General Manager of the area, the position from which he now retires. In addition to his railway duties, Mr. Hornsby has represented the L.N.E.R. as a Director of several road transport companies, including the United Automobile Services Limited; the Northern General Transport Co. Ltd., the West Yorkshire Road Car Co. Ltd., the East Yorkshire Motor Services Limited, Currie & Co. (Newcastle), Ltd. Indeed, we believe it was in the North Eastern Area of

Photo by [*Lafayette*

Mr. Thomas Hornsby,

Divisional General Manager, North Eastern Area, L.N.E.R., 1928-36

Elliott] [*& Fry*

Mr. C. M. Jenkin Jones,

Appointed Divisional General Manager, North Eastern Area, L.N.E.R.

the L.N.E.R. that a separate bus undertaking was first controlled by a railway, for in 1929 the company bought Emmerson & Sons' undertaking which worked between Newcastle and Carlisle. Following upon that purchase other bus concerns were acquired and ultimately the L.N.E.R. formulated its present policy of acquiring interests in the various omnibus concerns which operate throughout the L.N.E.R. territory. First as Rating Solicitor, then as Goods Manager and finally as Divisional General Manager, Mr. Hornsby has been well known and greatly esteemed by the traders, municipal and local authorities in the North Eastern Area, with whom his relations have always been most friendly and cordial, as they will doubtless continue to be though he will henceforth hold

Mr. J. C. Chambers,

Appointed Road Transport Liaison Officer, General Manager's Office, Southern Railway

a new appointment, in which we wish him all success.

Mr. C. M. Jenkin Jones, who, as announced above, has been appointed Divisional General Manager, North Eastern Area, L.N.E.R., was born in 1885, and educated at Brighton College and The Queen's College, Oxford. He entered the service of the former North Eastern Railway in January, 1908. After a few months' training he was transferred to Hull and attached to the District Superintendent's Office there until December, 1912, when he transferred to the Commercial Department, and subsequently became Chief Claims Clerk in the District Goods Manager's Office at Leeds. At the beginning of 1914 Mr. Jenkin Jones was attached to the General Manager's office for special work in connection with the opening of the King George Dock at Hull, and in October of that year was appointed Chief Clerk to the District Goods Manager at Middlesbrough. In August, 1915, he was lent by the railway company to the Ministry of Munitions, and on being released from that work returned to the North Eastern Railway in January, 1918, as Dock Agent at Middlesbrough. In July of the following year Mr. Jenkin Jones was transferred to the Chief Goods Manager's

Mr. S. T. Burgoyne, M.V.O., O.B.E.,

Appointed Superintendent, North Eastern Area, L.N.E.R.

Mr. H. Blin Stoyle,

Locomotive Superintendent & Acting Chief Mechanical Engineer, Kenya & Uganda Railways & Harbours, 1932 and 1935-36

office at York for special work in connection with the Goods Managers' Conference in London and the revision of railway rates, and in October, 1920, was appointed Assistant Goods Manager and a member of the Goods Managers' Conference. Transferred to the General Superintendent's Office at York in April, 1921, he was in October of that year appointed Assistant General Superintendent, the position he held at the time of the amalgamation. In April, 1923, he was appointed in association with the duties of that post to be Freight Rolling Stock Controller of the whole L.N.E.R. group, and on the January 1 following, was promoted additionally to be Superintendent of the North Eastern Area of the group: it is these two appointments that he now relinquishes to become Divisional General Manager. Mr. Jenkin Jones was nominated by the Railway Companies' Association, the Dock and Harbour Authorities' Association, and the National Council of Port Labour Employers as Technical Adviser to the British Delegation to the International Labour Conferences at Geneva in 1928, 1929 and 1932; and he was also elected Chairman of the Operating Superintendents' Conference,

Mr. G. Cornish,

Appointed District Goods Manager, Liverpool, Great Western Railway

R.C.H., for 1929. In that year also he was Employers' Representative on the Committee on Automatic Couplings of the International Labour Conference at Geneva. He has also been Chairman of the Conciliation Committee of the National Council of Port Labour Employers since 1934, and Vice-President of the North-East Coast Council of Port Labour Employers. He was awarded the Operating Medal of the Institute of Transport for 1933-34, and, at the request of the Palestine Government, visited that country in 1935 to advise and report upon its railways. Mr. Jenkin Jones holds a commission as Major in the Engineer and Railway Staff Corps (1925) and among his other appointments are the following:—

Member of the General Purposes Committee of the National Confederation of Employers' Organisations; Impartial Member and Vice-Chairman, East Riding Agricultural Wages Board (since 1932); Member of the Oxford University Appointments Committee; Member of the Executive Committee of the Oxford Society (since 1933); and Member of the Governing Body of Brighton College (since 1934).

Mr. S. T. Burgoyne, M.V.O., O.B.E., who, as announced above, has been appointed Superintendent of the North Eastern Area, L.N.E.R., joined the former North Eastern Railway at Hull in 1902, and, after filling various positions in the Goods Manager's and General Manager's offices at York, joined the Ministry of Munitions as Personal Assistant to Sir Eric Geddes in May, 1915. In August, 1916, he went to France and was made Deputy Assistant Director-General of Transportation with the rank of Captain R.E. In the following year he transferred to the Admiralty as Private Secretary to the First Lord, with the rank of Commander R.N.V.R. He was mentioned in despatches in April, 1917, awarded the M.V.O. (fourth class) in June of that year, and the O.B.E. (Military) in August of the same year. After the Armistice he joined the staff of the Ministry of Transport, returning to railway service in 1923 to become Industrial Agent, L.N.E.R. In the following year he was appointed Assistant Goods Manager, North Eastern Area, which position he held until his appointment as Manager of the Cheshire Lines Committee, in October, 1929. It was in December, 1932, that Mr. Burgoyne was appointed Passenger Manager, North Eastern Area, L.N.E.R., the position he now vacates to become Superintendent of that area.

Mr. J. C. Chambers, who, as announced in THE RAILWAY GAZETTE of July 31, has been appointed to succeed Mr. H. A. Short as Road Transport Liaison Officer to the General Manager of the Southern Railway, took up his new duties at Waterloo on August 1. He was born in 1900 and, after serving in the Army during the last year of the war, he went up to Balliol College, Oxford, in 1919, obtained Honours in Modern History in 1922, and took his B.A. degree in the same year. He also obtained a blue for Rugby Football in 1921. On leaving Oxford Mr. Chambers at first read for the Bar, passing his Final Examination in 1924, but he joined the Solicitor's Department of the Southern Railway in the same year, becoming a solicitor in 1928. He is part-author, with Mr. E. Gilbert Woodward, of "Woodward's Road Traffic Acts and Orders 1930-1934," and for some years has dealt with road traffic licensing work on behalf of the Southern Railway Company.

Mr. George Cornish, who, as announced in THE RAILWAY GAZETTE of August 7, has been appointed District Goods Manager of the Great Western Railway at Liverpool, following the retirement of Mr. Thomas Martin, joined the company's service in 1923, and, after experience in the Chief Goods Manager's office, was appointed staff clerk in September, 1926. Three years later he went to Oxford as Goods Agent, and in 1931 was transferred to a similar post at South Lambeth. It was in January, 1933, that he was promoted to the Goods Agency at Bristol, the position he now relinquishes on his new appointment.

Mr. H. Blin Stoyle, A.M.I.Mech.E., Locomotive Superintendent, and Acting Chief Mechanical Engineer of the Kenya & Uganda Railways and Harbours, is at present on leave in Great Britain. He was born in 1890 and educated at Queen Elizabeth's Grammar School, Crediton; Battersea Polytechnic; and University College, Southampton; prior to becoming a premium apprentice to the late Mr. Dugald Drummond on the former London & South Western Railway. Thereafter he gained experience at Barnstaple and Exeter sheds, at Nine Elms and Eastleigh works and in drawing and running offices, and was for 18 months Assistant to the Manager of Eastleigh running shed before proceeding to British Honduras in Government employment. From 1914 to 1921 Mr. Stoyle was Mechanical Engineer, Stann Creek, and from 1918 onwards was, in addition, Acting Superintendent. He was also Acting Director of Public Works, British Honduras, from July, 1919, to March, 1920, and was then appointed Acting District Commissioner of the Stann Creek District in addition to his duties on the railway. In July, 1921, he was transferred to the Tanganyika Government Railways as Assistant Locomotive Superintendent and was promoted District Locomotive Superintendent in March, 1923. It was in September, 1932, that Mr. Stoyle was appointed Locomotive Superintendent, Kenya and Uganda Railways & Harbours, and since May, 1935, he has been Acting as Chief Mechanical Engineer of that administration. He is an A.M.I.Mech.E. and in 1920 was appointed J.P. of British Honduras

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L.M.S.R. APPOINTMENTS

The following appointments have been approved by the directors:—

Chief Commercial and Chief Operating Managers' Departments.

Mr. H. Cowpe, Goods Agent, Chorley, to be Goods Agent, Darwen.

Mr. S. J. Whitehead, Stationmaster, Bletchley, to be Stationmaster, Warrington.

Mr. W. H. Phillips, Stationmaster, Llandudno, to be Stationmaster, Stafford (also supervises L.N.E.R. Passenger Department interests at Stafford Town & Stafford Common stations). From November 1, 1936.

Mr. R. Arkinstall, Stationmaster, Longsight, to be Stationmaster, Llandudno. From November 1, 1936.

Chief Operating Manager's Department.

Mr. R. L. Millward, Assistant District Controller, Birmingham, to be Outdoor Assistant to Divisional Superintendent of Operation, Crewe.

Mr. S. H. Gould, Chief Passenger Trains Clerk, office of Divisional Superintendent of Operation, Crewe (located at Euston), to be Assistant Divisional Controller (Passenger Services), office of Divisional Superintendent of Operation, Crewe.

Mr. H. Heyes, Assistant District Controller, Kentish Town, to be District Controller, Rowsley.

Mr. S. A. Wilson, Controller, Kentish Town, to be Assistant District Controller, Kentish Town.

Mr. E. Lees, Assistant District Controller, Liverpool (Lime Street) to be Assistant District Controller, Birmingham.

Mr. T. P. Strafford, Assistant District Controller, Chester, to be Assistant District Controller, Liverpool (Lime Street).

Mr. B. J. Pilkington, Assistant District Controller, Barrow, to be Assistant District Controller, Chester.

Scottish Changes.

Mr. H. Fowler, Assistant Works Superintendent, Chief Mechanical Engineer's Department, Earlestown, to be Assistant Works Superintendent (Locomotives), Chief Mechanical Engineer's Department, St. Rollox.

Mr. J. M. Munro, Master, Marine Department, Stranraer, to be Harbourmaster, Ayr.

We regret to record the death, on August 3, of Professor H. S. Foxwell, Emeritus Professor of Political Economy at London University. His connection with railways lay in his unique collection of books upon that subject. Beginning in 1874 with a second-hand copy of Lardner's "Railway Economy," he eventually assembled what is now the famous Goldsmith's Economic Library—the collection of which was his main life's work—for which he bought, among many other libraries, the John Urpeth Rastrick collection on English railways.

We regret to record the death, on August 9, of Mr. Claud William Kinder, C.M.G., M.Inst.C.E., the well-known pioneer of Chinese railways, and for many years General Manager and Engineer-in-Chief of the Imperial Chinese Railways. Born in 1852, he was trained in England, Canada, France and Russia, and was appointed Assistant Engineer, Imperial Japanese Railways in 1873. Proceeding to China in mining interests, he subsequently became Engineer-in-Chief and General Manager of the Imperial lines in North China, and Consulting Engineer to the Peking-Mukden Railway. Mr. Kinder is credited with being responsible for the first standard gauge railway construction in China, and was on the Imperial Railways Staff in 1901, afterwards becoming Director-General of Railways in the Ministry of Communications, the position from which he retired in 1909. He was created a C.M.G. in 1900, receiving a medal and clasp and was mentioned in despatches at the relief of Peking, received the honour of Mandarin of the Red Button in 1905, and also the Order of the Double Dragon.

XUM

A Remarkable L.N.E.R. Locomotive Performance

Time Recovery by a 69-ton G.N. Atlantic with a 585-ton train

One of the most remarkable feats of locomotive performance ever achieved in the history of the London & North Eastern Railway or its predecessors took place on Tuesday, July 28, between Grantham and York. In consequence of slight heating trouble, it was deemed advisable to detach at Grantham the Pacific locomotive which was hauling through to Newcastle the 1.20 p.m. express from King's Cross, and substitution had to be made by whatever locomotive was immediately available,

L.N.E.R., GRANTHAM–YORK
Engine: G.N. 4-4-2, No. 4404.
Driver: Walker (Gateshead).
Load: 17 cars, 546 tons tare, 585 tons full.

Distance miles		Schedule min.	Actual min.	sec.	Speeds m.p.h.
0·0	GRANTHAM ...	0	0	00	—
4·2	Barkstone ...	—	8	17	—
6·0	Hougham ...	—	10	03	—
9·9	Claypole	—	13	23	74
14·6	NEWARK ...	15	17	23	—
20·9	Carlton-on-Trent	—	23	22	64½
21·9	Crow Park ...	—	24	19	—
25·8	Dukeries junction	—	28	30	48
28·2	*Markham* ...	—	31	31	48½
33·1	RETFORD ...	35	36	15	77½†
36·2	Sutton	—	38	49	72½
38·4	Ranskill	—	40	37	74
40·3	Scrooby	—	42	08	75
42·2	Bawtry	—	43	43	—
44·0	*Piper's Wood* ...	—	45	22	61
45·8	Rossington ...	—	47	03	—
47·7	*Black Carr junc.*	—	48	38	72½
50·5	DONCASTER ...	53	51	19	55*
52·6	Arksey	—	53	30	—
54·7	*Shaftholme junc.*	—	55	36	62½
57·5	Moss	—	58	15	64
60·5	Balne	—	61	02	65
61·8	Heck	—	62	17	60
64·3	Temple Hirst ...	—	64	42	66
67·5	*Brayton junc.* ...	—	67	41	—
68·9	SELBY	73	69	17	30*
73·0	Riccall	—	75	18	55
75·6	Escrick	—	78	04	59
78·5	Naburn	—	80	56	60
80·7	*Chaloner's Whin junc.*	—	83	09 sigs.	—
82·7	YORK	90	87	40	—

* Service slack. † Maximum speed before Retford.

which turned out to be one of the ex-Great Northern Ivatt Atlantics, No. 4404. Although the train weighed no less than 585 tons the 4-6-2 engine (No. 2595, *Trigo*) had made an excellent run, passing Peterborough, 76·4 miles, in 78 min. 8 sec. from King's Cross. After that, the engine was worked more easily to Grantham (105·5 miles), which was reached in 116 min. 41 sec.

With this enormous train, and a locomotive having only 20 in. × 24 in. cylinders, an adhesion weight of 36 tons, and a total weight (without tender) of only 69 tons—which meant that, inclusive of tender, the Atlantic had to haul a gross load about nine times its own weight—substantial loss of time was now to be expected, and the more so as the driver, Walker, of Gateshead, though doubtless familiar with the working of all North Eastern Area express types, could hardly be expected to have the same familiarity with the working of an ex-Great Northern locomotive. Furthermore, it was evident from externals that No. 4404 had not been through general overhaul at any recent date; neither was the condition of fire or steam pressure at such short notice suitable for a haulage proposition of this description. A certain amount of difficulty was therefore experienced in starting the train at Grantham, and the first 4·2 miles to Barkstone, level for two miles, and then falling, occupied 8 min. 17 sec. But from there No. 4404 performed the astounding feat of working this train of almost 600 tons in weight over the 63·3 miles to Brayton Junction, Selby, in 59 min. 24 sec., at an average speed of 64 m.p.h. throughout, thereby passing Brayton Junction in practically "even time" from the start (67·5 miles in 67 min. 41 sec.), and gaining no less than 6 min. on schedule between Newark and Selby. Of the intermediate times the most notable was the 15 min. 4 sec. over the 17·4 miles from Retford to Doncaster, which alone was a gain of 3 min. on schedule, and included a slowing to 55 m.p.h. through Doncaster; from Sutton to Ranskill the engine was maintaining from 72½ to 74 m.p.h. on level track, and the 3-mile ascent to Piper's Wood, which includes 2 miles at 1 in 198, did not bring the speed below 61 m.p.h. On recovering from the Doncaster slack, Driver Walker again succeeded in working the speed up to 66 m.p.h. on the long level stretch to Selby. Here the usual 30 m.p.h. slowing was made over the swing-bridge, and but for the fact of being slowly hand-signalled to a stop beyond the platform end at York, the gain on schedule of 3¾ min. (to Selby) would probably have been maintained; as it was, the 82·7 miles were completed in 87 min. 40 sec., start-to-stop, whereas the schedule allows 90 min.

Notwithstanding the fact that the arrival at Grantham had been 2¾ min. late, and that time had inevitably been lost in deciding to detach No. 2595 and changing the crew over on to No. 4404, the arrival at York was only 8 min. late. Here a 2-cylinder N.E. Atlantic was attached as pilot, and leaving York 10 min. late, the two engines had reduced the arrears to 7 min. at Darlington by running the 44·1 miles in 45 min. 17 sec. start-to-stop. The recorder of these times (Mr. Cecil J. Allen) left the train at Darlington, but the arrival at Newcastle, where engines are changed, was very little behind schedule time. Driver Walker deserves congratulation for this masterly feat of locomotive handling.

The Verney Junction Branch, Met. & G.C. Joint

(*See illustrations on page* 269)

We are indebted to Mr. F. H. Stingemore for the series of snapshots reproduced on page 269 of the Quainton Road to Verney Junction branch of the Metropolitan Great Central Joint Committee, on which the passenger train service ran for the last time on July 4. In addition to Granborough Road and Winslow Road, the two intermediate stations on the branch, the Metropolitan & Great Central Joint Committee closed at the same time Waddesdon station on the main line.

When the railway to Verney Junction was opened, on September 23, 1868, it constituted part of the main line of the Aylesbury & Buckingham Railway Company, and remained as such right up to the time of the absorption of that company by the Metropolitan Railway (under an Act of July 25, 1890) as from July 1, 1891.

When the opening to passenger traffic of the Great Central Railway's extension to London in 1899, the section between Aylesbury and Quainton Road became part of an important trunk route, and the Quainton Road to Verney Junction section was relegated to the status of a comparatively unimportant branch. Although remaining the property of the Metropolitan Railway (and its successor, the London Passenger Transport Board) the whole line between Harrow South Junction and Verney Junction has been leased since April 2, 1906, to the Metropolitan & Great Central Joint Committee.

The Verney Junction branch begins at a point ¼ mile north-west of Quainton Road station. For another quarter of a mile the main L.N.E.R. line and the branch run side by side, but the latter finally bears away northwards and almost at once begins to climb. A 2-mile rise, called the Hogshaw bank, carries the line over a shoulder of Quainton Hill; the fall is shorter, but almost as steep. Verney Junction is 50¼ miles from London, and a little under 6 miles from Quainton Road junction. This line possesses no features of engineering interest; there are but four overbridges and only one cutting in the whole six miles, all near the Quainton Road end. Station buildings are substantial brick structures.

The line passes through quiet agricultural country, and Verney Junction, with no village to serve, was simply an interchange station between Metropolitan & Great Central Joint Line trains and the L.M.S.R. Banbury, Oxford, and Cambridge services. Apart from such interchange traffic the passenger traffic on the branch has been very small, but there is a considerable transfer of goods traffic between the Metropolitan Line and the L.M.S.R. at Verney Junction. The latter is being continued, and the branch remains open for this purpose.

MINISTRY OF TRANSPORT ACCIDENT REPORT

Rugby, L.M.S.R. : April 2, 1934

The 7.45 p.m. fitted freight train, Camden to Edge Hill, came into side-long collision at 10.18 p.m. with the rear vehicles of the 6.20 p.m. partly-fitted freight train, Camden to Birm'ngham, as it was drawing out of the down goods yard; the guard of the latter was fatally injured. The former train had 19 wagons, all vacuum braked, with piped van, and was drawn by engine No. 5602, 4-6-0 type, having a six-wheeled tender, with steam brake controlled by vacuum on all except bogie wheels, weighing 134 tons. The 6.20 p.m. train had a similar engine, No. 5596, 50 wagons and van, the leading four being vacuum fitted. The engine of the 7.45 p.m. train was apparently derailed for 45 yd. and re-railed to Tunstall, and the Irish Mail. Signalman Lambourne, at No. 7 box, was therefore instructed by Control to send the 7.45 p.m. train by the down slow line although it usually travels on the down fast, using the crossover No. 30 opposite that box.

The 6.20 p.m. train had been working in the down sidings, and was coming out of them via the down through goods line and crossover 32/33, signal 11 having been lowered for it to run to the Birmingham line. Signalman Lambourne accepted the 7.45 p.m. train under Regulation 4, being authorised to do so, and left the outer home No. 15 at danger, locked, in any case, by the crossover ahead reversed. The annunciator rang, showing the train had arrived at the outer home, but as it rings for 10 seconds only it did not suggest to him that the train had failed to stop. He heard it approaching, but too late to do anything; his detonator placers are practically at the inner homes, just beyond the point of collision. Signals 18 and 21 had been lowered for the Tunstall excursion, but Lambourne sent "obstruction danger" after the collision and the train was stopped at No. 5 box home signal.

Driver Worthington of the 7.45 p.m. train found the distant signals against him for eight boxes in succession including Rugby No. 7, but their home signals off up to Rugby No. 5. He passed Rugby station at 10 to 15 m.p.h. and approaching No. 7 box saw No. 18 signal off (see plan) and mistook it for No. 15. Continuing at slow speed he saw the down Birmingham inner home, No. 11, off and mistook it for No. 12, remarking to his fireman that they were going by the slow line. He did not see the tail lamp of the 6.20 p.m. train until it was a few yards away, when he made a full brake application. He estimated his speed at not much more than 5 m.p.h. at the moment of the impact. Fireman Nursaw generally confirmed these statements. After seeing No. 4 box home off he commenced firing and was doing so until the collision occurred. Guard Davies confirmed the driver's statements as to speed and brake application; he could not see No. 7 box home signals owing to smoke and some vans in his train, but was on his verandah looking out for signals. Signalman Lambourne estimated that both trains were running at about 10 m.p.h.

Inspecting Officer's Conclusions

Responsibility for this accident lies with Driver Worthington, who frankly admitted he had made a mistake. He had been working this train regularly, probably 20 or 30 times, having been in the link for about 12 months. He stated that he had learnt the road thoroughly both by day and night and signed the route card last in January; he had never found any difficulty in identifying the signals passing through Rugby, but had very seldom been stopped there and never been diverted to the slow line at this point, his usual route being over crossover No. 30 to the down fast. A driver since 1919, he has a fairly good record. Colonel Trench does not think he can be blamed for not seeing the tail lights of the 6.20 p.m. train, but considers that the speed was probably not less than 15 m.p.h., as the engine travelled 108 yd. after the collision. It is unfortunate that Guard Davies, who has 37 years' service—Goods Guard since 1900—and a very good record, was unable to detect the outer home at danger, but there is no reason to doubt that he was on the lookout.

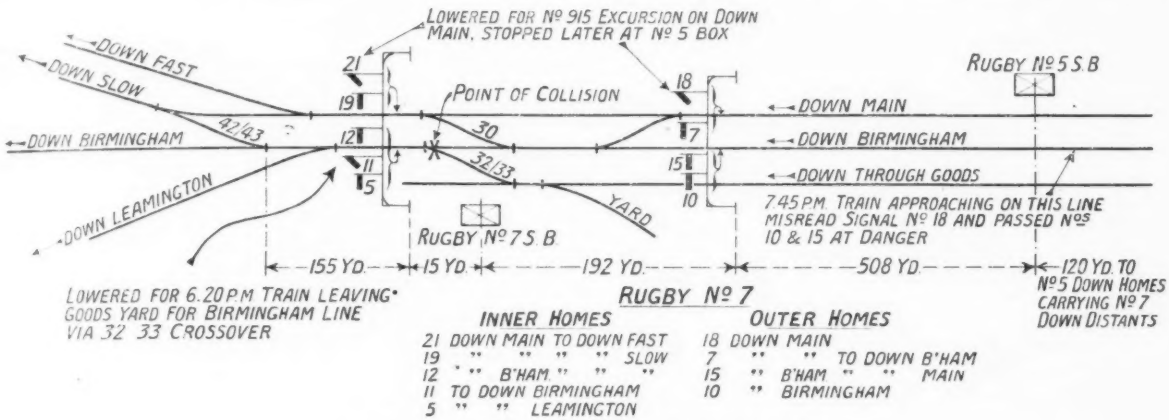

Diagram illustrating collision at Rugby, L.M.S.R.

Remarks

Colonel Trench has no recommendation to make. He discussed the arrangement of the signals with the company's officers but was unable to offer any criticism or suggest any improvement that would avoid the risk of such a mistake recurring. A new colour-light signalling scheme for Rugby is understood to be under preparation.

NOTES AND NEWS

London-Guernsey Air Service Suspended.—Jersey Airways Limited, a railway associated concern, has announced that its service between London and Guernsey has been suspended indefinitely.

New Cooking Equipment for Manchester Central Station.—It has been decided to renew the whole of the cooking equipment in the kitchen of the refreshment rooms at Manchester Central station, Cheshire Lines Railway.

Improved Dining Room Service for the G.N. Hotel, Leeds.—As part of the scheme of improvement for the G.N. Hotel, Leeds, the L.N.E.R. has decided to instal new kitchen equipment, including a 13-ft. steam-heated carrying table with carving dishes which will be one of the largest in the country.

Pickfords Licences.—For simplicity, the road licences of all the undertakings in the Pickfords and Hay's Wharf group are being concentrated in the parent company—Hay's Wharf Cartage Co. Ltd.—and appropriate applications are being made to the various traffic commissioners. The subsidiary companies concerned include Pickfords Limited, Venn & McPherson Limited, and Garlick, Burrell & Edwards Limited.

Another Pickfords Acquisition Pending.—We learn officially that negotiations are in an advanced stage with a view to the acquisition by Pickfords Limited of the Express Transport Service (Wellingborough) Limited. The company, which was incorporated on September 15, 1933, to take over an existing partnership business of G. W. Bates and H. J. Harrison (who became the directors of the company), is concerned chiefly with long-distance road transport between the Wellingborough district and London; about two dozen vehicles are employed.

Station Improvements in Suburban Area, L.N.E.R.—The L.N.E.R. proposes to improve its stations between Liverpool Street and Hertford (East) Stratford and Shenfield, and on the Enfield Town, Palace Gates, and Chingford branches. These stations handle over 60,000,000 passengers a year, as well as a large and growing parcels traffic. The alterations will take the form, where necessary, of improved booking, waiting, and lavatory accommodation, modernised lighting, and the provision of more effective direction boards, and train indicators. The whole of the stations will be repainted in brighter colours. The L.N.E.R. has for some time past been improving many stations, particularly those in the eastern suburbs of London. Some months ago, for example, the whole of the stations between Stratford and Loughton were overhauled, painted in brighter colours and generally brought up to date.

New London Transport Works.—Within the next few days work is scheduled to begin on the new Uxbridge terminus of the Piccadilly and Metropolitan lines, and tunnelling should be in progress on the Bakerloo extension by the end of this month. The Mile End to Leyton section of the Central London extension is to be begun about the end of September; the Lea valley has to be crossed, and underground water is expected to increase the cost by as much as £250,000 a mile above the normal figure for London tube construction of £750,000.

Road Vehicles Licensed in Great Britain.—The Minister of Transport has issued a return giving particulars of the number of motor vehicles registered for the first time under the Roads Act, 1920, during the month of June, 1936. The total was 38,536 compared with 32,148 in June, 1935, and the figures for the several classes were :—

	June, 1936	June, 1935
Cars taxed on horsepower	24,803	21,351
Cycles	5,175	4,421
Hackney vehicles	771	883
Goods vehicles	6,177	5,019
Other vehicles	1,610	474
	38,536	32,148

Fast Belgian Schedules.—Two very fast runs are now being made by steam trains on the Ostend route of the Belgian National Railways. Train No. 3041 leaves Brussels (Midi) at 11.50 a.m. and arrives at Ostend (Quai) at 12.57 p.m., the 71·2 miles being covered non-stop in 67 min. at an average of 63·9 m.p.h. In the reverse direction, train No. 3044 leaves Ostend (Quai) at 19.13 and arrives in Brussels (Midi) at 20.21, the 68 min. representing an average speed of 63 m.p.h. The maximum permissible speed remains at 75 m.p.h. and both services are "trains bloc," or trains of limited formation.

Prize for Standardised Enquiry Office Design.—There are 71 railway offices in various parts of London dealing with the issue of tickets, enquiries, parcels and goods; to improve and standardise their appearance, it has been decided to seek the co-operation of the R.I.B.A. by organising an open competition, for which all British architects are eligible to compete. Prizes to the value of £500 are offered, and full details can be obtained from Mr. W. H. Hamlyn, F.R.I.B.A., Chief Architect, London Midland & Scottish Railway, St. Pancras Chambers, N.W.1. The closing date for the competition is November 7. The judges of the competition are Mr. Charles Holden, F.R.I.B.A., who was awarded the Gold Medal for Architecture by the King last April; Mr. L. H. Bucknell, Secretary of the R.I.B.A., and Chairman of its Competition Committee; Mr. W. H. Hamlyn, F.R.I.B.A., Chief Architect, L.M.S.R.; and Mr. C. Grasemann, M.A., Public Relations and Advertising Officer of the Southern Railway. It is desired to extend the work of these offices to issuing tickets and answering enquiries for all the companies, and therefore a standardised design is sought which will impress upon the public the fact that these are joint railway offices.

Tyneside Electric Services.—Following the recent orders for new electric rolling stock, the L.N.E.R. has now made arrangements for certain improvements to be made to the stations and signals on the North Tyneside electrified lines. The new improvements include the extension of the station platforms at Howdon, Walkergate, Benton, and Percy Main to enable them to accommodate eight-car trains; alterations to signalling and the provision of additional track circuits; and the extension of the siding at Killingworth crossing to avoid long mineral trains blocking the up electric line.

The Swansea & Mumbles Railway.—At the recently-held annual meeting of the Mumbles Railway & Pier Company, the Chairman, Mr. H. C. M. Daniell, referred to the Bills promoted by the South Wales Transport Co. Ltd. seeking powers to abandon the Swansea tramway system. He said that company had met him in a very fair way, and after lengthy negotiations had introduced new clauses which fully safeguarded the interests of shareholders of the Mumbles Company in the opinion of its legal advisers. One of the clauses dropped related to the reduction of the train service to and from the pier. The assignment of the lease of the railway and pier from the Swansea Improvements & Tramways Company to the South Wales Transport Co. Ltd. had been ratified. There was a new clause providing that nothing in the Bill should take away, prejudice or diminish the obligations of the South Wales Transport Company to work, use, and manage the undertaking so as to develop the traffic thereon. Under another clause the Swansea Corporation, in December, 1957, might purchase *inter alia* the interest of the South Wales Transport Company as assignee of the lease.

Improved Operating in the U.S.S.R.—A year ago M. Stalin called a meeting of representatives of the railway workers at the Kremlin, and impressed upon them how vital was railway transport to the development of the country and to the consolidation of national defence. To improve that form of transport he insisted that a standard must be attained such that 80,000 wagons a day would be loaded. The *Izvestia* now reports that 90,000 wagons are at present being loaded daily, and—states the Reuters message from Moscow containing this information—the total wagon-loading figures

for the first half of 1936 exceed those for 1935 by over 40 per cent.

King's Cross Station, L.N.E.R.—Following the opening of a new inquiry office, repointing, and other improvements at King's Cross, the L.N.E.R. is now proceeding to effect another minor alteration at the terminus, for the existing unsightly wooden barriers are to be replaced by handsome iron railings and gates with illuminated platform numbers; indicators are to be provided over the gates showing train departure times. Also, the suburban station refreshment room is to be reconstructed; the new premises will be equipped with an up-to-date bar and a frontage of modern design with a kiosk included therein.

Turbine Locomotive for Union Pacific Railroad.—America is to have its first turbo-electric locomotive. The Union Pacific Railroad has placed an order with the General Electric Company for the electrical equipment, and the railroad and the electric company will co-operate in its construction. The locomotive will be equipped with two 2,500-h.p. units which may be operated separately or together, and the combined units will be designed to pull a 1,000-ton (2,000-lb.) trailing load at 110 m.p.h. Oil fuel will be used, and sufficient water and fuel will be carried for a run of 550 miles non-stop. The steam turbine of each unit will be connected directly to a 225-kW, 3-phase, 60-cycle, 220-V. generator which will provide power for its six traction motors.

Road Accidents.—The Ministry of Transport return for the week ended August 8 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year :—

	Killed, including deaths resulting from previous accidents		Injured	
England ...	135	(132)	4,699	(4,955)
Wales	4	(9)	324	(323)
Scotland ...	11	(20)	495	(444)
	150	(161)	5,518	(5,722)

The total fatalities for the previous week were 130, compared with 138 for the corresponding period of last year.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 32nd Week.			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,916¾ mls.)						
Passenger-train traffic...	783,000	776,000	+ 7,000	15,833,000	15,619,000	+ 214,000
Merchandise, &c. ...	368,000	344,000	+ 24,000	14,973,000	14,131,000	+ 842,000
Coal and coke ...	155,000	144,000	+ 11,000	7,611,000	7,233,000	+ 378,000
Goods-train traffic ...	523,000	488,000	+ 35,000	22,584,000	21,364,000	+ 1,220,000
Total receipts	1,306,000	1,264,000	+ 42,000	38,417,000	36,983,000	+ 1,434,000
L.N.E.R. (6,332 mls.)						
Passenger-train traffic...	512,000	518,000	— 6,000	10,198,000	10,116,000	+ 82,000
Merchandise, &c. ...	255,000	249,000	+ 6,000	10,195,000	9,832,000	+ 363,000
Coal and coke ...	180,000	175,000	+ 5,000	7,342,000	6,967,000	+ 375,000
Goods-train traffic ...	435,000	424,000	+ 11,000	17,537,000	16,799,000	+ 738,000
Total receipts	947,000	942,000	+ 5,000	27,735,000	26,915,000	+ 820,000
G.W.R. (3,746½ mls.)						
Passenger-train traffic...	355,000	357,000	— 2,000	6,600,000	6,566,000	+ 34,000
Merchandise, &c. ...	133,000	124,000	+ 9,000	5,969,000	5,732,000	+ 237,000
Coal and coke ...	54,000	53,000	+ 1,000	3,177,000	3,116,000	+ 61,000
Goods-train traffic ...	187,000	177,000	+ 10,000	9,146,000	8,848,000	+ 298,000
Total receipts	542,000	534,000	+ 8,000	15,746,000	15,414,000	+ 332,000
S.R. (2,154 mls.)						
Passenger-train traffic...	482,000	480,000	+ 2,000	9,684,000	9,627,000	+ 57,000
Merchandise, &c. ...	46,000	48,000	— 2,000	1,958,500	1,943,500	+ 15,000
Coal and coke ...	16,000	17,000	— 1,000	989,500	930,500	+ 59,000
Goods-train traffic ...	62,000	65,000	— 3,000	2,948,000	2,874,000	+ 74,000
Total receipts	544,000	545,000	— 1,000	12,632,000	12,501,000	+ 131,000
Liverpool Overhead ... (6½ mls.)	1,595	1,655	— 60	37,821	37,740	+ 81
Mersey (4½ mls.) ...	4,642	4,762	— 120	129,097	128,311	+ 786
*London Passenger Transport Board ...	548,300	538,500	+ 9,800	3,335,900	3,270,600	+ 65,300
IRELAND						
Belfast & C.D. pass. (80 mls.)	4,094	4,172	— 78	81,388	82,737	— 1,349
,, ,, goods	445	515	— 70	17,637	16,015	+ 1,622
,, ,, total	4,539	4,687	— 148	99,025	98,752	+ 273
†Great Northern pass. (543 mls.)	19,350	19,150	+ 200	325,500	317,500	+ 8,000
,, ,, goods	6,750	6,900	— 150	296,350	286,550	+ 9,800
,, ,, total	26,100	26,050	+ 50	621,850	604,050	+ 17,800
†Great Southern pass. (2,067 mls.)	66,561	65,162	+ 1,399	1,078,394	1,067,263	+ 11,131
,, ,, goods	35,224	29,242	+ 5,982	1,256,627	1,179,785	+ 76,842
,, ,, total	101,785	94,404	+ 7,381	2,335,021	2,247,048	+ 87,973

* 6th week. † 31st week. August Bank Holiday, 1936 and 1935.

British and Irish Railways Stocks and Shares

Stocks	Highest 1935	Lowest 1935	Prices Aug. 12, 1936	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	44½	52*	+1½
5% Con. Prefce. ...	124	108	120½*	−1½
5% Red.Pref.(1950)	117	106¾	109½*	−2
4% Deb.	118½	108	115	—
4½% Deb.... ...	122	110	117½	—
4½ Deb.	129½	118	125	—
5% Deb.	140¼	130	136½	—
2½% Deb.... ...	82¼	68½	76	—
5% Rt. Charge ...	137	128	134½	—
5% Cons. Guar. ...	136¾	120½	131*	−2
L.M.S.R.				
Ord.	25 5/16	16	28½	+1½
4% Prefce. (1923)	58¼	43½	78½*	+½
4% Prefce. ...	87½	73½	88*	−2½
5% Red.Pref.(1955)	107	97¾	106½*	−2
4% Deb.	110¼	99½	107	—
5% Red.Deb.(1952)	119 11/16	115 5/16	116½	—
4% Guar. ...	105 5/8	95½	104*	−½
L.N.E.R.				
5% Pref. Ord. ...	15 7/8	8¼	13	+½
Def. Ord.	7 9/16	4¾	7	+1
4% First Prefce.	74¾	48	75½	+2½
4% Second Prefce.	31¾	16¼	30	+1½
5% Red.Pref.(1955)	92¼	71	96½	+1
4% First Guar. ...	103 11/16	93	101*	−½
4% Second Guar.	98¾	82½	95*	−1
3% Deb.	86	75	82	—
4% Deb.	109¼	98½	106	—
5% Red.Deb.(1947)	118¼	106½	111½	—
4½% Sinking Fund Red. Deb.	112½	108	109	—
SOUTHERN				
Pref. Ord.... ...	87½	69 3/8	93*	—
Def. Ord.	25 13/16	16¾	23	+½
5% Prefce. ...	124	108¼	121*	−1
5% Red.Pref.(1964)	117¾	109½	116½*	−2
5% Guar. Prefce.	136½	121½	131*	−1½
5% Red.Guar.Pref. (1957)	121¼	112½	117½*	−2
4% Deb.	116¾	107	113½	—
5% Deb.	138	130¼	135½	—
4% Red. Deb. 1962–67	115	106½	111½	—
BELFAST & C.D.				
Ord.	9	4	5	—
FORTH BRIDGE				
4% Deb.	111¼	104¼	104½	—
4% Guar.	109 7/8	104	104½	—
G. NORTHERN (IRELAND)				
Ord.	20	7	14½	−1
G. SOUTHERN (IRELAND)				
Ord.	57½	14½	58	−1½
Prefce.	50	25¼	58	—
Guar.	88¾	51¼	90	—
Deb.	86¼	70	94	+1
L.P.T.B.				
4½% "A" ...	130	119¾	122½	—
5% "A" ...	139¾	130	134½	—
4½% "T.F.A." ...	113¾	108	109	—
5% "B" ...	131½	122¾	128½	—
"C"	109½	91	105	—
MERSEY				
Ord.	23 1/8	9¼	25½	—
4% Perp. Deb. ...	100½	93½	98	—
3% Perp. Deb. ...	75½	67	74½	—
3% Perp. Prefce.	62	47¼	64½	—

* ex dividend

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RAILWAY AND OTHER REPORTS

Great Southern Railways.—The directors of the Great Southern Railways Company, at their meeting on August 7, decided that the consideration of the declaration of an interim dividend on the cumulative guaranteed preference stock, and arrears due in respect thereof, be deferred until the accounts for the twelve months ending December 31, next are received. No interim dividends on the preference and ordinary stocks of the company are available.

Pondicheri Railway.—The company's portion of the net profits for the year ended March 31, was Rs. 13,115, realising £996. From last year, £4,904 was brought forward, and after payment of the interim dividend there is £5,636 remaining. The final dividend of 15 per cent., making 20 per cent. tax free on the year, will absorb £1,050, leaving £4,586, subject to tax, to carry forward. The sinking fund has been increased by £115 to £2,816.

Rohilkund & Kumaon Railway Company.—Gross earnings for the half-year ended March 31, improved by Rs. 182,974 over those of 1934–5, so that although working expenses were Rs. 15,432 up, there remained out of the total of Rs. 3,956,828, net earnings of Rs. 2,210,977 — an increase of Rs. 167,542. Out of this sum the company's share is £72,451 (£4,561 more than a year ago), and adding £23,798 brought forward, together with £325 gain by exchange, makes a total of £96,574. After paying an interim dividend of 4 per cent. for the half-year, plus a bonus of 3 per cent. (the total of 7 per cent. comparing with a dividend of 6 per cent. a year ago), less tax at 2s. 7d. in the £ on the ordinary stock, the amount carried forward is £41,161.

London Electric Transport Finance Corporation Limited.—This company was incorporated on July 10, 1935, to raise and lend to the London Passenger Transport Board, the G.W.R., and the L.N.E.R. the money (up to £40,000,000) necessary for carrying out the railway improvement works authorised by Parliament last year. The report for the period from incorporation to December 31, 1935, states that, upon incorporation, the company created £32,000,000 2½ per cent. debenture stock (1950-55), guaranteed by H.M. Treasury; this was offered at 97 per cent. and fully subscribed. The proceeds of the issue have, after consultation with the Treasury and the Standing Joint Committee set up under the London Passenger Transport Act, 1933, been employed or invested for various terms so as to become available to meet the estimated borrowing requirements of the transport undertakers. Preliminary expenses amounted to £56,791, the whole of which has been recovered from transport undertakers; expenses of administration are also recoverable from transport undertakers under terms of agreement made with them. Investments are shown as £11,923,531, and cash as £8,708,761.

Bengal & North Western Railway.—Gross earnings for the half year ended March 31 rose by Rs. 9,21,546, compared with the corresponding period of 1935 to Rs. 1,93,29,944, whereas working expenses rose by Rs. 1,13,387, the ratio of expenses to receipts falling from 43·12 to 41·65. Net earnings rose from Rs. 1,04,70,287 to Rs. 1,12,78,446, the company's share being higher by £37,945 at £442,552. To this is added £78,073 brought forward and £1,841 for gain by exchange, making £522,466. After providing for debenture interest and preference dividend and making provision for the annual payment of £35,000 to the sinking fund, the board has declared an interim dividend of 4 per cent., together with a bonus of 4 per cent., or 8 per cent. in all, for the half year (unchanged), less tax at the rate of 2s. 7d. in the £ on the ordinary stock. This will leave a balance of £125,785 to be carried to the second half of the year. The Secretary of State for India has an option to purchase the company's railway on December 31, 1937, on giving the company 12 months' previous notice in writing of such determination. No intimation has yet been received from the Secretary of State.

Craven Brothers (Manchester) Limited.—The directors have declared an interim dividend of 5 per cent., payable on September 30. Early in July, 1,000,000 of the company's 5s. shares were offered for sale at 10s. a share.

Aldershot & District Traction Co. Ltd.—This company, which is controlled jointly by the Southern Railway Company and Tilling & British Automobile Traction Limited, secured during the year ended May 31, 1936, traffic receipts and other revenues amounting to £330,414, as compared with £314,908 for 1934-35. After deducting all expenses chargeable to revenue, including depreciation, and after transferring £10,000 (£17,000) to general reserve, there remains a balance of £16,341 (£16,078), which, added to £16,632 brought forward from last year, leaves an available balance of £32,973 (£32,632). The directors recommend a dividend of 8 per cent. (the same) on the share capital, amounting to £16,000, and that £16,973 be carried forward.

Staff and Labour Matters

A special delegate conference of the National Union of Railwaymen assembled in London on Tuesday, August 11, to consider Decision No. 1, dated July 27, of the Railway Staff National Tribunal, a report of which was given on pages 220-222 of last week's issue. At the conclusion of the meeting it was officially announced that the conference had decided to accept the decision. In addition, the Railway Clerks' Association reached a similar conclusion, and it is expected that the railway companies will agree to give effect to the decision as from the beginning of the first full pay following August 16—which was the date named in paragraph 10, part I, of the decision. This will mean that the deduction of 2½ per cent. from the earnings of conciliation and salaried grades will be reduced to 1¼ per cent.; also, day overtime worked by conciliation grades will be paid for at the rate of time-and-a-quarter and night overtime (*i.e.*, between the hours of 10.0 p.m. and 4.0 a.m.) at the rate of time-and-three-eighths.

It is likely that the benefit of the reduced percentage deduction will be extended to other groups of staff not covered by the main machinery of negotiation. As already reported in our issue of July 3, railway shopmen, police, and electrical staff have benefited by a similar reduction as from the beginning of July. Thus the earnings of practically all railway employees will now be subject to the general deduction of 1¼ per cent.

It was decided on Wednesday at the resumed delegate conference in London of the National Union of Railwaymen to make a demand on the railway companies for a minimum wage of 50s. a week for all grades of workers. This claim is to be lodged next February, as soon as the current year's earnings of the companies are known. The new claim of the N.U.R. is to be made contemporaneously with a demand for the cancellation of the outstanding portion of the 1931 cuts.

ARGENTINE GOVERNMENT AND THE CORDOBA CENTRAL RAILWAY.—A Reuters message from Buenos Aires suggests that the Anglo-Argentine Special Trade Agreement Mission, which is shortly leaving that city for England, is likely to discuss the question of the purchase by the Argentine Government of the British-owned Cordoba Central Railway.

B.S.S. FOR CREOSOTE FOR THE PRESERVATION OF TIMBER—The British Standard Specification No. 144, entitled "Creosote for the Preservation of Timber," has been revised. It includes three types of creosote, derived from the three main types of coal tar, and the inclusion of creosote from blast-furnace tar is retained. Copies of this B.S. Specification (No. 144-1936) can be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 2d. post free.

WANTED—THE RAILWAY GAZETTE, June 28, 1935. Box No. 12, c/o *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

ARGENTINE. British Engineering Firm long established at Buenos Aires, with office and technical staff, is prepared to accept agencies for Engineering products. Excellent connection with Railways. Write Box No. 6, c/o *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1

OFFICIAL NOTICES

OFFICIAL ADVERTISEMENTS.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

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CONTRACTS AND TENDERS

Sir W. G. Armstrong Whitworth & Co. (Engineers) Limited has received an order from the San Paulo Railway for two 600-b.h.p. supercharged streamlined diesel-electric trains, the bodies of the passenger coaches of which will be built by the Birmingham Railway Carriage & Wagon Co. Ltd.

Wagons for Sudan

The Gloucester Railway Carriage & Wagon Co. Ltd. has received an order from the Sudan Government Railways for 40 bogie all-steel 30-ton covered goods wagons complete with wheels and axles and Vacuum brake gear.

Evans & Bevan Limited has placed orders for a total of 100 12-ton wagons equally divided between the Cambrian Wagon Co. Ltd. and Marcroft Wagons Limited.

Hurst, Nelson & Co. Ltd. has received an order from Charrington, Gardner, Lockett & Co. Ltd. for 50 high-sided four-wheeled coke wagons.

New Coal-Loading Apparatus for Methil Docks

The L.N.E.R. is installing and will bring into use at an early date a Morison-Leonard anti-breaker, supplied by the Birtley Co. Ltd., at the port of Methil, in order to improve the facilities for the loading of the large volume of coal cargoes dealt with there. This new appliance is specially constructed to eliminate a vertical drop into the hold, and the resultant breakage of coal during shipment. Its main equipment consists of a crane on the dockside, a telescopic tube and control skirt, and a whip winch to operate the control skirt. When fully extended, the telescopic tube with control skirt reaches from the feeding point down to the bottom of the hold, and, so long as coal is being fed to the apparatus, the tube is being gradually telescoped. When the hold is full, and the tube therefore completely telescoped, the apparatus is easily unshipped. The anti-breaker is capable of discharging up to 500 tons of coal per hour and can be employed with equal advantage to other materials where it is essential to avoid breakage during loading operations.

Deutsche Getriebe G.m.b.H. has received a further contract from the German State Railway for the supply of 50 Mylius transmission sets for railcars of 150 b.h.p. These sets are of the four-speed type. There are now over 650 Mylius transmission sets in service or on order, of which two-thirds are on railway systems outside Germany.

Stewarts and Lloyds Limited has received an order from the Central Argentine Railway for 1,200 steel boiler tubes.

Locomotives Required for India

Tenders are invited by the Rohilkund & Kumaon Railway, receivable at 237, Gresham House, Old Broad Street, London, E.C.2, by August 31, for two tank and two tender locomotives.

Wagons for India

The Société Gregg D'Europe, S.A., has received orders for a total of 440 four-wheeled open-goods wagons, IRCA type MC3, without wheels and axles and to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton as follow : Bengal-North Western Railway, 400 and Rohilkund & Kumaon Railway, 40 wagons.

Fried. Krupp A.G. has received the order for the total of 880 wheels and axles required for the above mentioned wagons to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

Leyland Motors Limited has received the following orders from railway-associated road transport operators :—

Devon General Omnibus & Touring Co. Ltd., four oil-engined Titans, and two Tigers.

East Kent Road Car Co. Ltd., 20 oil-engined Titans.

New South Wales Department of Road Transport, one Titan.

East Midland Motor Services Limited, 10 oil-engined Tigers.

Southdown Motor Services Limited, 14 Cubs.

Sheffield Corporation, 15 oil-engined Titans with torque converters.

The South African Railways & Harbours Administration is calling for tenders (No. 972) for the supply and delivery of quantities of copper and steel plates for locomotive boilers and perforated spark arrestor mild steel plates. Tenders endorsed " Tender No. 972, Copper and Steel Plates for Locomotive Boilers and Spark Arrestor Plates," should be received by the Secretary to the Tender Board, South African Railway Headquarter Offices, Johannesburg, by September 28.

The South African Railways & Harbours Administration is calling for tenders (Contract No. 979) for the supply and delivery of quantities of mild steel sections and plates required for the building of 40 underframes for third class main line saloons. Tenders endorsed " Tender No. 979, for Steel " should be addressed to the Chief Stores Superintendent, Park Station Chambers, Rissik Street, Johannesburg, receivable by August 31.

Alfol Insulation Limited has received orders for complete sets of Alfol insulation required for six boilers for B class locomotives and 14 boilers for HSM class locomotives, Bengal-Nagpur Railway.

Railcars Required for Uruguay

The Uruguayan State Railways Administration is calling for tenders, to be presented in Montevideo by September 14, for the supply of four motor railcars. Firms desirous of offering railcars of United Kingdom manufacture can obtain further details of this call for tenders from the Department of Overseas Trade.

Stahlunion Export G.m.b.H., through Gossell & Son Limited has received an order for 57,500 steel sleepers for the Antofagasta (Chili) & Bolivia Railway.

Usines et Aciéries Allard, through C. M. Hill & Co. has received an order from the Cordoba Central Railway for 400,000 dogspikes.

R. A. Lister & Co. Ltd. is supplying the 30 auto-trucks for conveying visitors round the grounds of the Empire Exhibition in Johannesburg this autumn, and is to have a comprehensive display of products on the stands (Nos. 76/79 in Pavilion A) of its distributor in South Africa, Stewarts and Lloyds of South Africa Limited.

NEW TRADING ESTATE AT GATESHEAD.—It has been announced that the site for the first of the trading estates to be situated in the Special Areas, which were referred to by the Minister of Labour at the end of the last parliamentary session, has been chosen on approximately 700 acres of land in the Team Valley immediately west of Low Fell station, Gateshead, on the L.N.E.R. main line. In making the announcement, Col. K. C. Appleyard, Chairman of North Eastern Trading Estates Limited, remarked that the proximity of the site to the railway should make it possible to supply the London market overnight as conveniently as from any other estate in the country.

Railway Share Market

Conditions in the stock and share markets have been active following the more reassuring views which developed regarding the European political situation. Home railway stocks were strong under the stimulus of the acceptance by the N.U.R. of the Tribunal's award restoring half the outstanding balance of the 1931 wages cut. It is assumed that this decision will mean that the outlook for the main line railways is much more clearly defined than for a long time past, and that, bearing in mind the savings in rates, the net revenue for the current half of the year should show favourable improvement, even allowing for the likelihood that there will be further increased expenditure on new equipment. Last week's aggregate traffic increase of £54,000 was below expectations, but confidence regarding the traffic outlook is general, particularly in regard to the L.M.S.R. and L.N.E.R. as these railways will benefit from the activity in the heavy industries.

L.M.S.R. ordinary was again very prominent and touched 28¾ on Wednesday. As much as £42,000 of last week's aggregate traffic increase was accounted for by the L.M.S.R. figures. The 4 per cent. and 1923 preference continued active at higher prices, as they still give apparently generous yields. L.N.E.R. first and second preference were again good, and interest in the preferred and deferred tended to broaden. It is realised that it may be some while yet before the two last named stocks can be within sight of a dividend, but the assumption is that they will probably respond readily in price if traffic receipts are favourable for the rest of the year. Last week the railway's traffics showed only a small gain, namely £5,000.

G.W.R. was in larger demand at higher prices and 52 was reached on Wednesday, the £8,000 traffic gain being regarded as relatively satisfactory. Southern deferred and preferred were rather less in evidence, but the preferred was favoured as the yield appears attractive. The market expects the railway's traffics will make a more encouraging showing shortly; last week there was a decrease of £1,000.

Foreign railway stocks were not particularly active. Most of the Argentine railway stocks made rather lower prices, but B.A. Pacific and B.A. Western were relatively firm. Cordoba Central debentures came into renewed request on yet another revival of the rumour of the forthcoming acquisition of the line. Elsewhere San Paulo moved up strongly to 54½. French railway Sterling bonds have declined sharply; no heavy selling has been reported, but there were apparently few buyers about even at the lower levels.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1935-36	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1935	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1935	Prices: Lowest 1935	Prices: Aug. 12, 1936	Prices: Yield (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	834	9.8.36	10,980	+ 1,930	32	428,280	392,490	+ 35,790	Ord. Stk.	23	14 15/16	16 1/2	Nil
	Argentine North Eastern	753	8.8.36	9,321	+ 1,648	6	51,308	47,319	+ 3,989	,,	7	4	3 1/2	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	49 1/2	30	47 1/2	8 7/16
	Bolivar	174	July, 1936	6,600	+ 1,300	30	47,600	44,700	+ 2,900	6 p.c. Deb.	13	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	14	11	13 1/2	3 1/4
	Buenos Ayres & Pacific	2,806	8.8.36	75,585	+ 1,554	6	415,500	436,057	— 20,557	Ord. Stk.	101 1/2	47 8	8	Nil
	Buenos Ayres Central	190	25.7.36	$124,000	— $4,300	4	$456,500	$490,100	— $33,600	Mt. Deb.	21	10	15 1/2	Nil
	Buenos Ayres Gt. Southern	5,084	8.8.36	112,939	— 4,159	6	599,275	676,445	— 77,170	Ord. Stk.	27	13 1/2	16 1/2	Nil
	Buenos Ayres Western	1,930	8.8.36	38,407	— 4,249	6	218,278	238,859	— 20,581	,,	24	10	13 1/2	Nil
	Central Argentine	3,700	8.8.36	135,416	+ 16,341	6	716,666	731,332	— 14,666	,,	177 8	7	11 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	9	3 1/4	6 1/2	Nil
	Cent. Uruguay of M. Video	273	1.8.36	10,364	+ 1,243	5	47,761	44,655	+ 3,106	Ord. Stk.	8 1/2	3	4	Nil
	Do. Eastern Extn.	311	1.8.36	1,781	+ 452	5	8,544	6,946	+ 1,598	—	—	—	—	—
	Do. Northern Extn.	185	1.8.36	1,560	+ 121	5	7,086	6,255	+ 831	—	—	—	—	—
	Do. Western Extn.	211	1.8.36	991	+ 89	5	4,419	3,105	+ 1,314	—	—	—	—	—
	Cordoba Central	1,218	8.8.36	40,520	+ 6,850	6	212,670	205,320	+ 7,350	Ord. Inc.	4	1	1 1/2	Nil
	Costa Rica	188	May, 1936	17,449	+ 3,582	48	159,922	176,238	— 16,316	Stk.	35	30	33	6 1/16
	Dorada	70	June, 1936	13,600	+ 1 800	26	79,300	66,800	+ 12,500	1 Mt. Db.	103 8	102 1/2	104 1/2	5 1/4
	Entre Rios	810	8.8.36	12,875	+ 1,165	6	67,604	71,210	— 3,606	Ord. Stk.	15	6 1/2	7	Nil
	Great Western of Brazil	1,082	8.8.36	5,300	+ 300	32	240,600	242,500	— 1,900	Ord. Sh.	1/2	3/16	1/2	Nil
	International of Cl. Amer.	794	June, 1936	$379,015	+ $7,469	26	$2,996,615	$2,632,186	+ $364,429	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/2	3/32	1/2	Nil
	La Guaira & Caracas	22¾	July, 1936	4,910	+ 1,185	30	32,250	27,570	+ 4,680	Stk.	8 1/2	8	5 1/2	Nil
	Leopoldina	1,918	8.8.36	20,008	— 2,297	32	562,512	525,560	+ 36,952	Ord. Stk.	8 1/2	2 1/2	4 1/2	Nil
	Mexican	483	7.8.36	$245,400	+ $2,800	6	$1,268,900	$1,392,600	— $123,700	,,	1 1/2	1/4	1/2	Nil
	Midland of Uruguay	319	June, 1936	7,548	+ 1,791	52	86,428	111,833	— 25,405	,,	1 1/2	1 1/2	1 1/2	Nil
	Nitrate	397	31.7.36	4,941	— 2,870	30	80,996	88,805	— 7,809	Ord. Sh.	64/-	42/-	29/16	Nil
	Paraguay Central	274	8.8.36	$2,786,000	+ $970,900	6	$14,791,000	$11,889,000	+ $2,902,000	Pr. Li. Stk.	80 1/2	60	72 1/2	8 1/4
	Peruvian Corporation	1,059	July, 1936	84,321	+ 10,508	4	84,321	73,813	+ 10,508	Pref.	10 5/8	6 7/16	10 1/2	Nil
	Salvador	100	1.8.36	¢8,885	— ¢2,875	5	¢47,073	¢65,348	— ¢18,275	Pr. Li.Db.	65	61	20	Nil
	San Paulo	153½	2.8.36	36,167	+ 11,927	31	925,315	740,105	+ 185,210	Ord. Stk.	80	35	56 1/2	4 7/16
	Taltal	164	July, 1936	2,525	—	5	2,525	2,525	—	Ord. Sh.	1 11/16	1 1/8	1 5/16	12 3/16
	United of Havana	1,353	8.8.36	17,193	+ 201	6	90,317	111,512	— 21,195	Ord. Stk.	3 1/16	1	2 1/2	Nil
	Uruguay Northern	73	June, 1936	778	+ 154	52	9,922	12,107	— 2,185	Deb. Stk.	4 1/2	2 15/16	4 1/2	Nil
Canada.	Canadian National	23,615	31.7.36	1,035,960	+ 8,999	30	20,151,544	19,005,943	+ 1,145,601	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	78 3/8	52 1/2	66 1/2	6
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	103 5/8	93	101 1/2	3 15/16
	Canadian Pacific	37	7.8.36	472,800	— 8,000	31	15,197,200	14,012,400	+ 1,184,800	Ord. Stk.	14 1/16	8 3/4	12	Nil
India.†	Assam Bengal	1,329	20.7.36	30,862	— 2,823	16	374,044	361,907	+ 12,137	Ord. Stk.	92 1/8	77 1/2	85 1/2	3 1/2
	Barsi Light	202	20.7.36	3,142	— 3,247	16	42,345	47 062	— 4,717	Ord. Sh.	105	77 1/2	72 1/2	6 7/8
	Bengal & North Western	2,112	20.7.36	62,647	+ 2,588	16	881,107	828,644	+ 52,463	Ord. Stk.	301 1/2	291	310	5 5/16
	Bengal Dooars & Extension	161	10.7.36	3,495	+ 32	14	32,237	33,243	— 705	,,	127 1/2	122	125 1/2	5 9/16
	Bengal-Nagpur	3,268	20.7.36	140,100	— 20,754	16	1,902,152	2,023,904	— 121,752	,,	105	100 5/16	102 1/2	3 7/8
	Bombay, Baroda & Cl. India	3,072	31.7.36	198,825	+ 24,525	18	2,924,475	2,725,800	+ 198,675	,,	115 1/4	110	111 1/2	5 7/8
	Madras & Southern Mahratta	3,229	20.7.36	147,900	+ 9,335	16	1,807,016	1,761,835	+ 45,181	,,	128 1/2	113 7/8	112 1/2	8
	Rohilkund & Kumaon	561	20.7.36	11,991	+ 994	16	177,939	164,075	+ 13,864	,,	294	262	308 1/2	5 5/16
	South India	2,532	20.7.36	105,435	— 6,084	16	1,249,030	1,279,657	— 30,627	,,	119 5/4	104 1/4	103 1/2	5 5/16
Various.	Beira-Umtali	204	May, 1936	70,177	+ 124	35	513,150	520,214	— 7,064	—	—	—	—	—
	Bilbao River & Cantabrian	15	June, 1936	1,397	+ 136	26	8,525	9,905	— 1,380	—	—	—	—	—
	Egyptian Delta	620	20.7.36	6,148	+ 624	16	63,624	58,038	+ 5,586	Prf. Sh.	2	15/8	1 3/4	5 11/16
	Great Southern of Spain	104	1.8.36	191	— 1,467	31	31,887	54,527	— 22,640	Inc. Deb.	3 1/2	2	3 1/2	Nil
	Kenya & Uganda	1,625	June, 1936	204,162	+ 40,600	26	1,430,672	1,293,183	+ 137,489	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	48	36	41 1/2	9 3/16
	Mashonaland	913	May, 1936	105,936	— 19,948	35	815,155	945,921	— 130,766	1 Mg. Db.	104 1/4	100	103 1/2	4 15/16
	Midland of W. Australia	277	June, 1936	11,961	+ 222	52	161,372	159.574	+ 1,798	Inc. Deb.	98 5/4	93	95 1/2	4 5/16
	Nigerian	1,905	20.6.36	27,244	+ 6,024	12	353,457	305,411	+ 48,046	—	—	—	—	—
	Rhodesia	1,538	May, 1936	182,817	— 15,586	35	1,479,847	1,542,173	— 62,326	4 p.c. Db.	105 1/2	101	105 1/2	3 15/16
	South African	13,263	18.7.36	595,903	+ 55,888	16	9,180,723	8,497,514	+ 683,209	—	—	—	—	—
	Victoria	4,728	Dec. 1935	866,995	— 3 320	26	4,826 292	4,751,974	+ 74,318	—	—	—	—	—
	Zafra & Huelva	112	May, 1936	8,821	— 2,027	22	48,574	55,398	— 6,823	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.